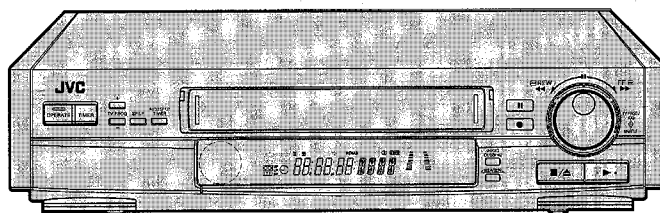


JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-E239EG



SHOWVIEW



Regarding service information other than these sections, refer to the HR-J238E service manual (No. 82530).
Also, be sure to note important safety precautions provided in the service manual.

SPECIFICATIONS

GENERAL

Power requirement	: AC 220 - 240 V~, 50/60 Hz
Power consumption	: 20 W
Temperature	
Operating	: 5°C to 40°C
Storage	: -20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 426 x 94 x 341 mm
Weight	: 4.5 kg
Format	: VHS PAL standard
Maximum recording time (SP)	: 240 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines 50 fields
Recording system	: Rotary two-head helical scan system (HR-E239EG)
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz
Input/Output	: 21-pin scart connectors (IN/OUT x 1, IN/DECODER x 1) RCA connectors (VIDEO IN x 1, AUDIO IN x 1)

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position "AU")
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF 47 - 89/104 - 300/ 302 - 470MHz UHF 470 - 862MHz
Aerial output	: UHF channel 36 (Adjustable 32 - 40)
Memory backup time	: Approx. 60 min.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6" battery x 2
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*Specifications shown are for SP mode unless otherwise specified.
E.& O.E. Design and specifications subject to change without notice.*

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5.PARTS LIST

5.2 CABINET AND CHASSIS ASSEMBLY<M2> 5-2

The following table indicate different parts number between models HR-J238E and HR-E239EG.

PACKING AND ACCESSORY ASSEMBLY <M1>

REF No.	MODEL ITEM	HR-J238E	HR-E239EG
101	PACKING CASE	PQ35532-11	PQ35361-15
102	CUSHION ASSEMBLY	PQ35533A-1	PQ35362A-1
103	POLY(FOAM)BAG	PQM30021-93	PQM30021-95
△ 106	REMOTE CONTROLLER	PQ21953A-3	PQ21953B-3
106A	COVER (BATTERY)	PQ46614	PQ46614-2
△ 110	INSTRUCTIONS	PU30425-1808	—
△	INSTRUCTIONS (ENGLISH)	—	PU30425-1895
△	INSTRUCTIONS (GERMANY)	—	PU30425-1896
△	INSTRUCTIONS (FRENCH)	—	PU30425-1897
△	INSTRUCTIONS (ITALIAN)	—	PU30425-1898
△	INSTRUCTIONS (SPANISH)	—	PU30425-1899
△	INSTRUCTIONS (DUTCH)	—	PU30425-1900
△	INSTRUCTIONS (DANISH)	—	PU30425-1901
△	INSTRUCTIONS (FINNESH)	—	PU30425-1902
△	INSTRUCTIONS (SWEDISH)	—	PU30425-1903
△	INSTRUCTIONS (NORWEGIAN)	—	PU30425-1904
111	POLY BAG	PQ35364-4 (1 piece)	PQ35364-4 (2 pieces)
112	SHEET (SPAIN)	PQ45146-96	PQ45146- 108
113	WARRANTY CARD	—	BT-20135
114	POLY BAG	—	PQ33909

Note: Mark — is not used.

CABINET AND CHASSIS ASSEMBLY <M2>

REF No.	MODEL ITEM	HR-J238E	HR-E239EG
150	FRONT PANEL ASSEMBLY	PQ11906G	PQ11802AN
150A	CASSETTE DOOR	PQ21915-5	PQ21818-29
150D	DOOR	—	PQ21822-28
△ 151	TOP COVER	PQ11676-7	PQ11676-31
152	SCREW/SPECIAL SCREW	SDSF3010M	PQ43930
154	KNOB(JOG)	—	PQ35247-5
155	KNOB(SHUTTLE)	PQ35473	PQ35295-5
156	SHUTTLE/JOG SHUTTLE ASS'Y	PEME0913	PEME0757-03
159A	DRUM SUB ASSEMBLY	PDM2282D	PDM2282Q
159C	BRUSH ASSEMBLY	PDM4400C-3	PDM4440A
162	SCREW, MAIN	—	SDSF3010Z
182	SIDE PANEL(L)	—	PQ11842
183	SIDE PANEL(R)	—	PQ11843
184	SPACER, ×2 MECH	—	PEME0947-01-01
WR2	WIRE,DISP/SW	—	PW30802-0514
WR6	WIRE,JOG	PW30218-0441613	PW30218-0831613

MAIN BOARD ASSEMBLY <03>

REF No.	MODEL ITEM	HR-J238E	HR-E239EG
PW1	MAIN BOARD ASSEMBLY	PB10980D-01	PB10980T
D712	DIODE	—	1N4148M-T2
D713	DIODE	—	1N4148M-T2
R304	RESISTER	—	QRSA08J-393YN
R305	RESISTER	—	QRSA08J-183YN
C305	CAPACITOR	—	QCYA1EK-333
CN705	CONNECTOR, SHUTTLE	PU59555-4	PU59555-8
CN1403	CONNECTOR, FRONT	—	PEMC1101-005

Note: Mark — is not used.

SW/DISPLAY BOARD ASSEMBLY <28>

REF No.	MODEL ITEM	HR-J238E	HR-E239EG
PW1	SW/DISPLAY BOARD ASSEMBLY	PB10973E1	PB10978A1
D1205	DIODE	—	1N4148M-T2
R1213	RESISTER	—	QRD161J-472
R1214	RESISTER	—	QRD161J-333
C1201	E CAPACITOR	QETC1CM-336	QEK1CM-336
C1203	E CAPACITOR	QETC1HM-106	QEK1CM-106
C1206	E CAPACITOR	QETC0JM-227	QEK0JM-227
C1207	CAPACITOR	—	QCVB1CN-103
S1220	TACT SWITCH, DISPLAY	—	PESW0525-02Z
CN1202	CONNECTOR, SW/JACK	PEMC0724-007	PEMC0724-011

REC SAFETY BOARD ASSEMBLY <32>

REF No.	MODEL ITEM	HR-J238E	HR-E239EG
PW3	REC SAFETY BOARD ASSEMBLY	PB10973A3	PB10978A3

CASSETTE SW BOARD ASSEMBLY <33>

REF No.	MODEL ITEM	HR-J238E	HR-E239EG
PW4	CASSETTE SWITCH BOARD ASSEMBLY	PB10973A4	PB10978A4

Note: Mark — is not used.

SW/JACK BOARD ASSEMBLY <36>

REF No.	MODEL ITEM	HR-J238E	HR-E239EG
PW2	SW/JACK BOARD ASSEMBLY	PB10973D2	PB10978A2
D1211	LED DIODE	—	SLR-342VR3F
D1235	DIODE	—	1SS133Y
D1236	DIODE	—	1SS133Y
R1217	RESISTER	—	QRD161J-331Y
R1230	RESISTER	—	QRD161J-560Y
R1231	RESISTER	—	QRD161J-200Y
C1214	CAPACITOR	—	QCB1HJ-561
C1216	CAPACITOR	—	QCB1HJ-561
L1204	COIL	—	PU59152-3R3JY
L1205	COIL	—	PU59152-3R3JY
S1211	TACT SWITCH, C. MEMORY	—	PESW0525-02
J1201	PIN JACK(SW)	—	PEMC1063-04
J1203	PIN JACK(SW)	—	PEMC1063-03
CN1203	CONNECTOR, DISPLAY	PEMC0723-007	PEMC0723-011
CN1204	CONNECTOR, (3-7)	—	PEMC1101-105

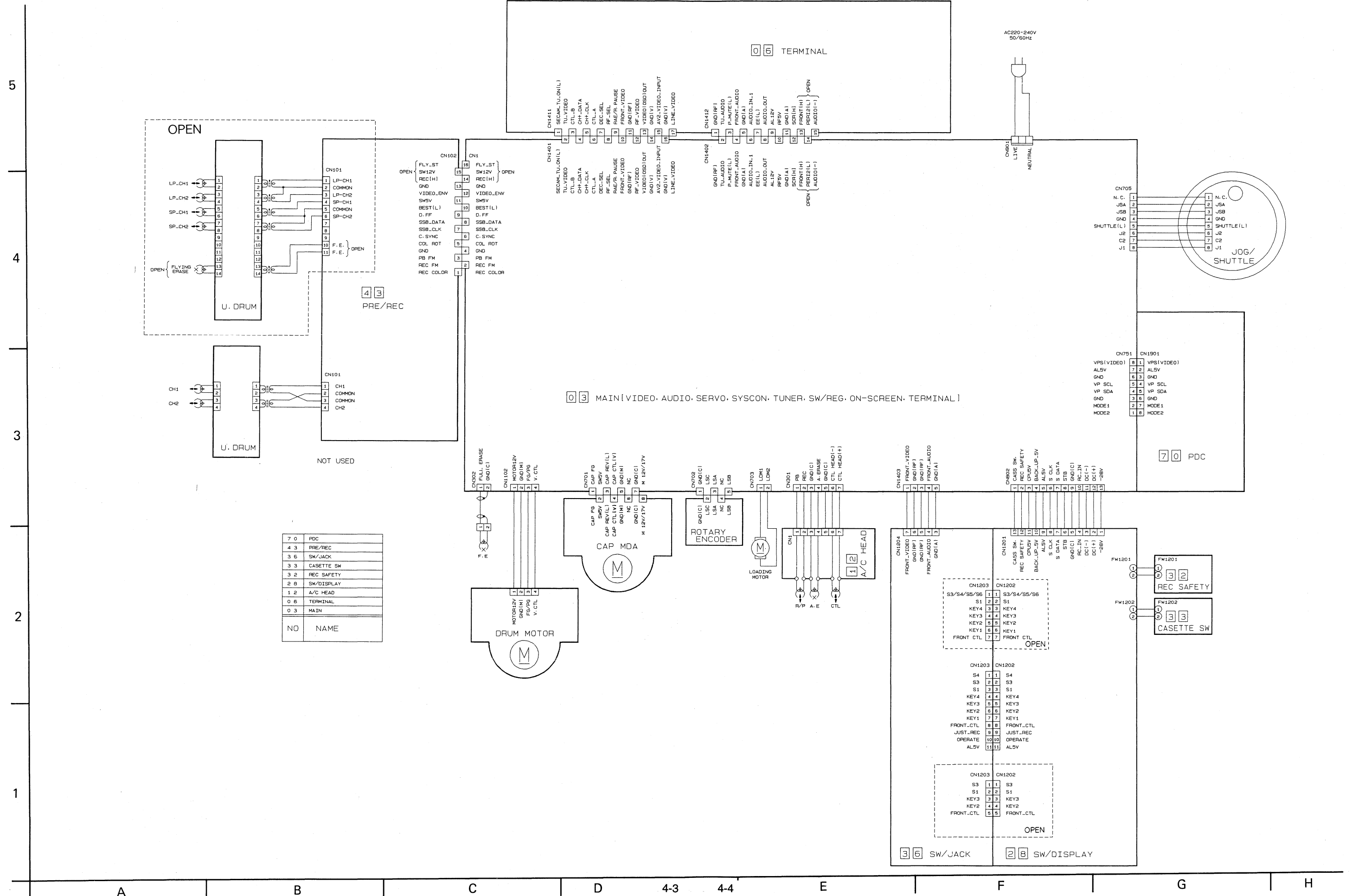
PDC BOARD ASSEMBLY <70>

REF No.	MODEL ITEM	HR-J238E	HR-E239EG
PW5	PDC BOARD ASSEMBLY	PB10973C5	PB10978A5

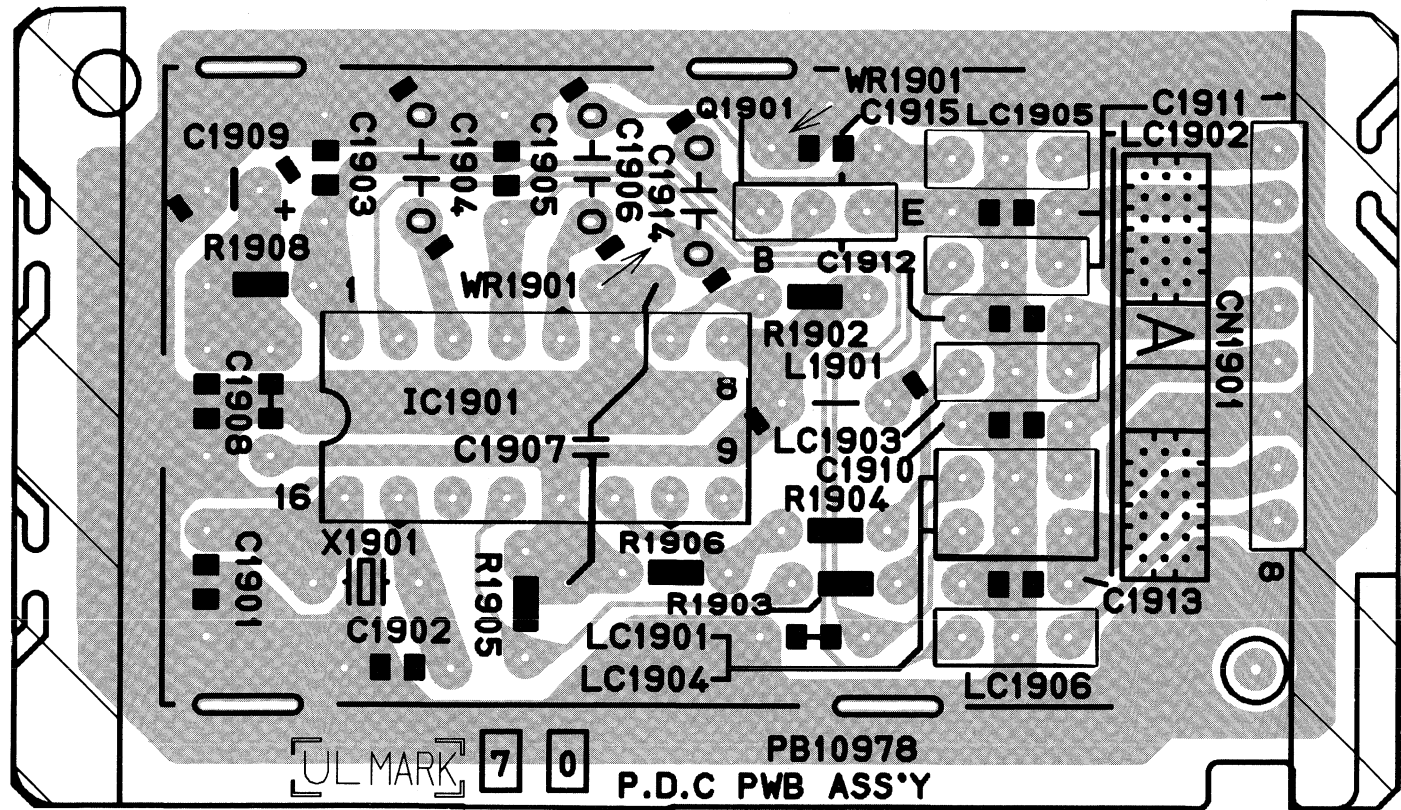
Note: Mark — is not used.

SECTION 4

CHARTS AND DIAGRAMS



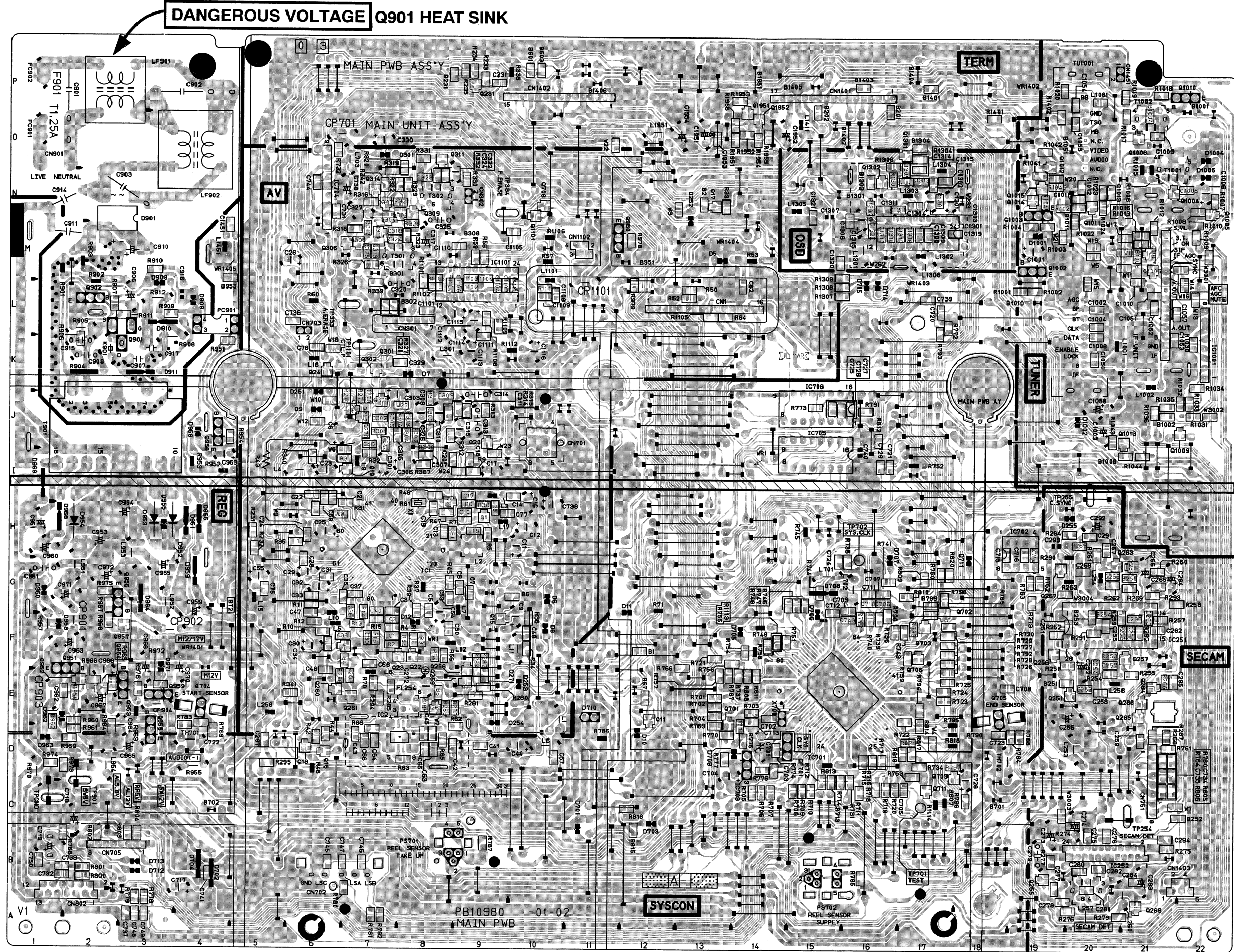
4.19 PDC CIRCUIT BOARD



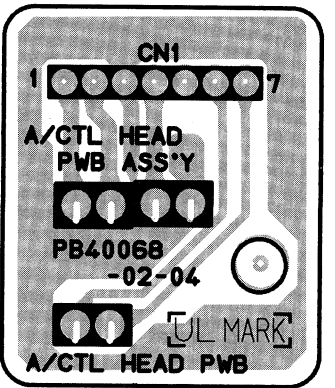
COMPONENT PARTS LOCATION GUIDE

REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION
C1	B C 7F	C314	A D 9J	C1102	B C 9L	D989	A D 11	Q703	B C 17F	R272	B C 7J	R759	B C 17F	R1021	B C 19N
C2	B C 7F	C315	A D 9J	C1103	B C 9M	D971	A D 3F	Q704	B C 17F	R273	B C 7J	R760	B C 17F	R1022	B C 20N
C3	B C 7F	C317	A D 8M	C1104	B C 9M	D1001	A D 19M	Q705	A D 18E	R274	B C 20C	R761	B C 21D	R1023	B C 20N
C4	B C 7F	C318	B C 7M	C1105	B C 10M	D1002	A D 20J	Q706	B C 17F	R275	B C 21B	R762	B C 19G	R1024	B C 20N
C5	B C 7F	C319	B C 7M	C1106	B C 9L	D1004	A D 22N	Q708	B C 10N	R276	B C 20A	R763	B C 19G	R1030	B C 22K
C6	A D 6J	C320	A D 7L	C1107	B C 9L	D1005	A D 22N	Q709	B C 18D	R277	B C 19B	R764	B C 21D	R1031	B C 22J
C7	B C 9G	C321	B C 7L	C1108	B C 10L			Q711	B C 17C	R279	B C 20A	R765	B C 17G	R1032	B C 22J
C8	B C 9G	C322	A D 8N	C1109	B C 10L			Q901	A D 2L	R280	B C 9E	R766	B C 13F	R1033	B C 22J
C9	A D 10F	C323	B C 8N	C1110	B C 9M			Q902	A D 2L	R281	B C 9E	R767	B C 13E	R1034	B C 22K
C10	B C 9H	C324	B C 8N	C1111	B C 9L			Q951	A D 1F	R282	B C 9E	R768	B C 2C	R1035	B C 21J
C11	A D 10H	C325	A D 8N	C1112	A D 9L			Q952	B C 2E	R283	B C 9E	R769	B C 13E	R1036	B C 21J
C12	A D 10H	C326	B C 8J	C1113	A D 9K			Q953	A D 3E	R284	B C 9E	R770	B C 13D	R1041	B C 19N
C13	B C 8H	C327	A D 7N	C1114	A D 9L			Q954	A D 3E	R285	B C 7E	R771	B C 14E	R1042	B C 19O
C14	B C 10I	C329	B C 8K	C1115	A D 9L			Q955	A D 3D	R286	B C 7E	R772	B C 17L	R1043	B C 20J
C15	B C 9I	C330	A D 7O	C1116	A D 10K			Q956	A D 3F	R287	B C 7E	R773	B C 15J	R1044	B C 21I
C16	A D 10I	C331	A D 14D	C1101	A D 17N			Q957	A D 14D	R288	B C 7E	R774	B C 14D	R1045	B C 19N
C17	A D 9I	C332	B C 14E	C1302	B C 17N			Q958	A D 14D	R289	B C 7E	R775	B C 14D	R1046	B C 19N
C18	B C 9I	C333	A D 14D	C1303	A D 17N			Q959	A D 14D	R290	B C 7E	R776	B C 14D	R1047	B C 19N
C19	B C 8I	C334	A D 14D	C1304	A D 17N			Q960	A D 11M	R291	B C 7E	R777	B C 14D	R1048	B C 19N
C20	B C 8I	C335	B C 17C	C1305	A D 16N			Q1002	A D 16I	R292	B C 7E	R778	B C 13D	R1049	B C 19N
C21	B C 8I	C336	B C 16G	C1306	B C 16N			Q1003	A D 16J	R293	B C 7E	R779	B C 13D	R1050	B C 19N
C22	B C 8I	C337	B C 16G	C1307	A D 15N			Q1004	A D 22K	R294	B C 7E	R780	B C 7B	R1051	B C 13L
C23	B C 8I	C338	B C 18E	C1308	B C 17M			Q1005	A D 22N	R295	B C 5D	R781	B C 7A	R1056	A D 10M
C24	A D 6H	C339	B C 16G	C1309	B C 17M			Q1006	B C 21M	R301	B C 7J	R782	B C 7A	R1057	B C 8L
C25	A D 6H	C340	B C 16G	C1310	B C 16N			Q1007	B C 21M	R302	B C 8J	R783	B C 4E	R1058	B C 9L
C26	A D 6H	C341	B C 16G	C1311	B C 16N			Q1008	B C 21M	R303	B C 8J	R784	B C 19D	R1059	B C 9L
C27	A D 6H	C342	B C 16G	C1312	B C 16M			Q1009	B C 21M	R304	B C 8J	R785	B C 16B	R1100	B C 10L
C28	A D 6H	C343	B C 14E	C1313	B C 17N			Q1010	A D 22P	R305	B C 7J	R786	A D 11D	R1111	B C 10L
C29	A D 6H	C344	B C 19H	C1314	B C 17O			Q1011	A D 22P	R306	B C 8J	R787	B C 9B	R1112	A D 10K
C30	A D 6H	C345	B C 18H	C1315	B C 17N			Q1012	B C 19O	R307	B C 8J	R788	B C 19D	R1113	B C 14F
C31	A D 6H	C346	B C 19H	C1316	B C 17M			Q1013	B C 19O	R308	B C 8J	R789	B C 4D	R1114	A D 17C
C32	A D 6H	C347	A D 4B	C1317	B C 16M			Q1014	B C 19N	R309	B C 8J	R790	A D 18D	R1301	B C 17N
C33	A D 6H	C348	A D 2C	C1318	B C 16M			Q1015	B C 19N	R310	B C 8J	R791	A D 16J	R1302	B C 16N
C34	A D 6H	C349	A D 1B	C1319	B C 17M			Q1016	B C 19N	R311	B C 8J	R792	A D 16J	R1303	B C 17N
C35	A D 6H	C350	B C 17L	C1320	B C 15M			Q1017	B C 19N	R312	B C 8J	R793	A D 16J	R1304	B C 17N
C36	A D 6H	C351	B C 16I	C1321	B C 15N			Q1018	B C 19N	R313	B C 8J	R794	A D 16J	R1305	B C 17N
C37	A D 6H	C352	B C 4E	C1322	B C 16M			Q1019	A D 10F	R314	B C 8J	R795	A D 16J	R1306	B C 17N
C38	A D 6H	C353	B C 18D	C1451	B C 4N			Q1020	A D 10F	R315	B C 8J	R796	A D 16J	R1307	B C 17N
C39	A D 6H	C354	B C 15H	C1951	A D 13O			Q1021	A D 5G	R316	B C 8J	R797	B C 7M	R797	B C 17G
C40	A D 6H	C355	B C 15J	C1952	A D 14O			Q1022	A D 5G	R317	B C 8J	R798	B C 7M	R798	B C 17G
C41	A D 6H	C356	B C 15J	C1953	B C 13O			Q1023	A D 5G	R318	B C 8J	R799	B C 7M	R799	B C 17G
C42	A D 6H	C357	B C 16J	C1954	A D 13O			Q1024	A D 5G	R319	B C 8J	R800	B C 7M	R800	B C 17G
C43	A D 6H	C358	A D 18D					Q1025	A D 5G	R320	B C 8J	R801	B C 7M	R801	B C 17G
C44	A D 6H	C359	B C 16I					Q1026	A D 5G	R321	B C 8J	R802	B C 7M	R802	B C 17G
C45	A D 6H	C360	B C 7N					Q1027	A D 5G	R322	B C 8J	R803	B C 7M	R803	B C 17G
C46	A D 6H	C361	B C 6N					Q1028	A D 5G	R323	B C 8J	R804	B C 7M	R804	B C 17G
C47	A D 6H	C362	B C 1B					Q1029	A D 5G	R324	B C 8J	R805	B C 7M	R805	B C 17G
C48	A D 6H	C363	B C 21D					Q1030	A D 5G	R325	B C 8J	R806	B C 7M	R806	B C 17G
C49	A D 6H	C364	B C 21D					Q1031	A D 5G	R326	B C 8J	R807	B C 7M	R807	B C 17G
C50	A D 6H	C365	B C 21D					Q1032	A D 5G	R327	B C 8J	R808	B C 7M	R808	B C 17G
C51	A D 6H	C366	B C 21D					Q1033	A D 5G	R328	B C 8J	R809	B C 7M	R809	B C 17G
C52	A D 6H	C367	B C 21D					Q1034	A D 5G	R329	B C 8J	R810	B C 7M	R810	B C 17G
C53	A D 6H	C368	B C 21D					Q1035	A D 5G	R330	B C 8J	R811	B C 7M	R811	B C 17G
C54	A D 6H	C369	B C 21D					Q1036	A D 5G	R331	B C 8J	R812	B C 7M	R812	B C 17G
C55	A D 6H	C370	B C 21D					Q1037	A D 5G	R332	B C 8J	R813	B C 7M	R813	B C 17G
C56	A D 6H	C371	B C 21D					Q1038	A D 5G	R333	B C 8J	R814	B C 7M	R814	B C 17G
C57	A D 6H	C372	B C 21D					Q1039	A D 5G	R334	B C 8J	R815	B C 7M	R815	B C 17G
C58	A D 6H	C373	B C 21D					Q1040	A D 5G	R335	B C 8J	R816	B C 7M	R816	B C 17G
C59	A D 6H	C374	B C 21D					Q1041	A D 5G	R336	B C 8J	R817	B C 7M	R817	B C 17G
C60	A D 6H	C375	B C 21D					Q1042	A D 5G	R337	B C 8J	R818	B C 7M	R818	B C 17G
C61	A D 6H	C376	B C 21D					Q1043	A D 5G	R338	B C 8J	R819	B C 7M	R819	B C 17G
C62	A D 6H	C377	B C 21D					Q1044	A D 5G	R339	B C 8J	R820	B C 7M	R820	B C 17G
C63	A D 6H	C378	B C 21D					Q1045	A D 5G	R340	B C 8J	R821	B C 7M	R821	B C 17G
C64	A D 6H	C379	B C 21D					Q1046	A D 5G	R341	B C 8J	R822	B C 7M	R822	B C 17G
C65	A D 6H	C380	B C 21D					Q1047	A D 5G	R342	B C 8J	R823	B C 7M	R823	B C 17G
C66	A D 6H	C381	B C 21D					Q1048	A D 5G	R343	B C 8J	R824	B C 7M	R824	B C 17G
C67	A D 6H	C382	B C 21D					Q1049	A D 5G	R344	B C 8J	R825	B C 7M	R825	B C 17G
C68	A D 6H	C383	B C 21D					Q1050	A D 5G	R345	B C 8J	R826	B C 7M	R826	B C 17G
C69	A D 6H	C384	B C 21D					Q1051	A D 5G	R346	B C 8J	R827	B C 7M	R827	B C 17G
C70	A D 6H	C385	B C 21D					Q1052	A D 5G	R347	B C 8J	R828	B C 7M	R828	B C 17G
C71	A D 6H	C386	B C 21D					Q1053	A D 5G	R348	B C 8J	R829	B C 7M	R829	B C 17G
C72	A D 6H	C387	B C 21D					Q1054	A D 5G	R349	B C 8J	R830	B C 7M	R830	B C 17G
C73	A D 6H	C388	B C 21D					Q1055	A D 5G	R350	B C 8J	R831	B C 7M	R831	B C 17G
C74	A D 6H	C389	B C 21D					Q1056	A D 5G	R351	B C 8J	R832	B C 7M	R832	B C 17G
C75	A D 6H	C390	B C 21D					Q1057	A D 5G	R352	B C 8J	R833	B C 7M	R833	B C 17G
C76	A D 6H	C391	B C 21D					Q1058	A D 5G	R353	B C 8J	R834	B C 7M	R834	B C 17G
C77	A D 6H	C392	B C 21D					Q1059	A D 5G	R354	B C 8J	R835	B C 7M	R835	B C 17G
C78	A D 6H	C393	B C 21D					Q1060	A D 5G	R355	B C 8J	R836	B C 7M	R836	B C 17G
C79	A D 6H	C394	B C 21D					Q1061	A D 5G	R356	B C 8J	R837	B C 7M	R837	B C 17G
C80	A D 6H	C395	B C 21D					Q1062	A D 5G	R357	B C 8J	R838	B C 7M	R838	B C 17G
C81	A D 6H	C396	B C 21D					Q1063	A D 5G	R358	B C 8J	R839	B C 7M	R839	B C 17G
C82	A D 6H	C397	B C 21D					Q1064	A D 5G	R359	B C 8J	R840	B C 7M	R840	B C 17G
C83	A D 6H	C398	B C 21D					Q1065	A D 5G	R360	B C 8J	R841	B C 7M	R841	B C 17G
C84	A D 6H	C399	B C 21D					Q1066	A D 5G	R361	B C 8J	R842	B C 7M	R842	B C 17G
C85	A D 6H	C400	B C 21D					Q1067	A D 5G	R362	B C 8J	R843	B C 7M	R843	B C 17G
C86	A D 6H	C401	B C 21D					Q1068	A D 5G	R363	B C 8J	R844	B C 7M	R844	B C 17G
C87	A D 6H	C402	B C 21D					Q1069	A D 5G	R364	B C 8J	R845	B C 7M	R845	B C 17G
C88	A D 6H	C403	B C 21D					Q1070	A D 5G	R365	B C 8J	R846	B C 7M	R846	B C 17G
C89	A D 6H	C404	B C 21D					Q1071	A D 5G	R366	B C 8J	R847	B C 7M	R847	B C 17G
C90	A D 6H	C405	B C 21D					Q1072	A D 5G	R367	B C 8J	R848	B C 7M	R848	B C 17G
C91	A D 6H	C406	B C 21D					Q1073	A D 5G	R368	B C 8J	R849	B C 7M	R849	B C 17G
C92	A D 6H	C407	B C 21D					Q1074	A D 5G						

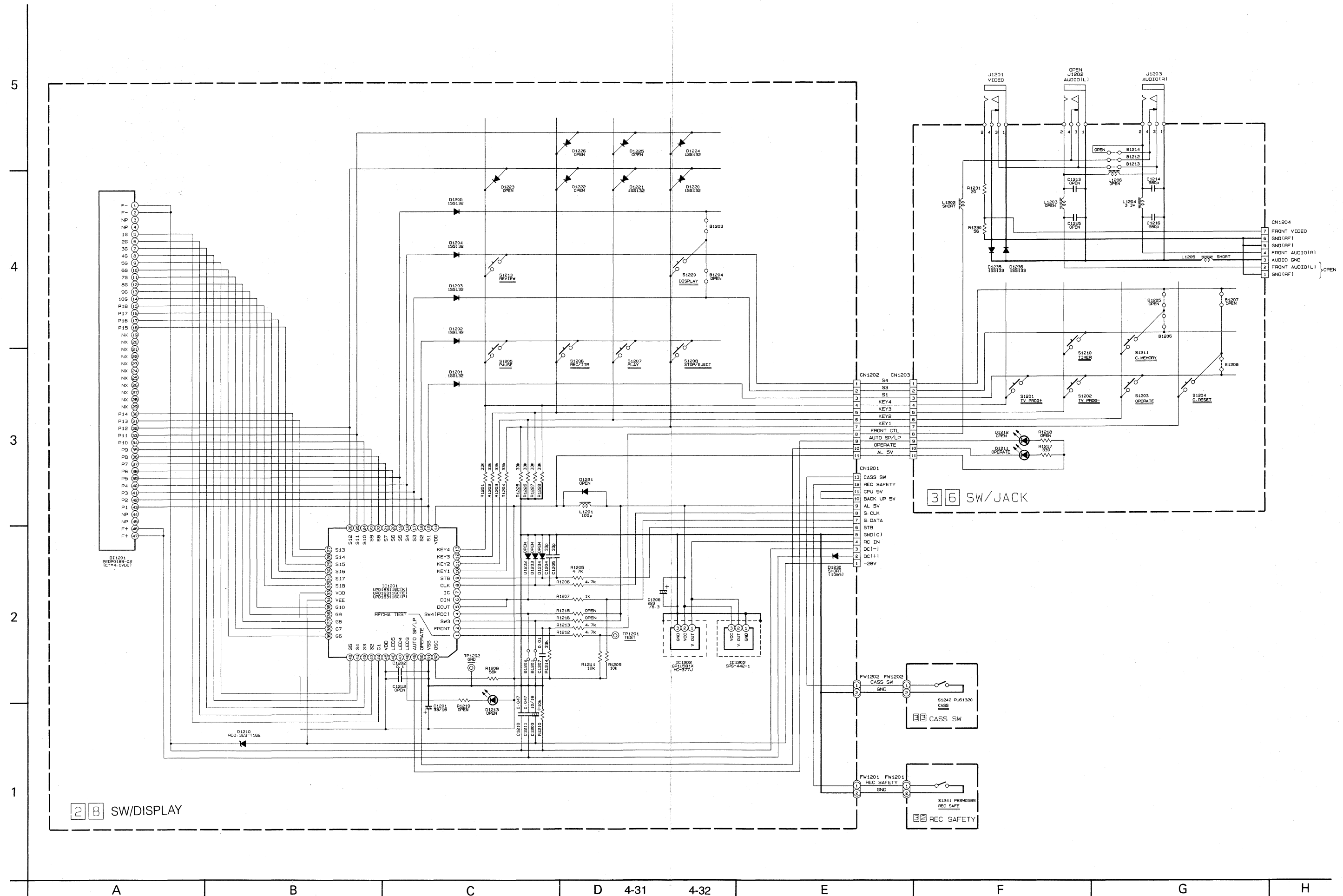
4.11 MAIN AND A/C HEAD CIRCUIT BOARDS



— A/C HEAD —

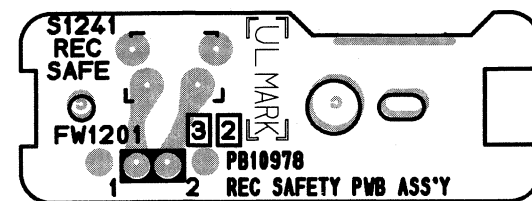


4.14 SW/DISPLAY, SW/JACK, REC SAFETY AND CASSETTE SW SCHEMATIC DIAGRAMS

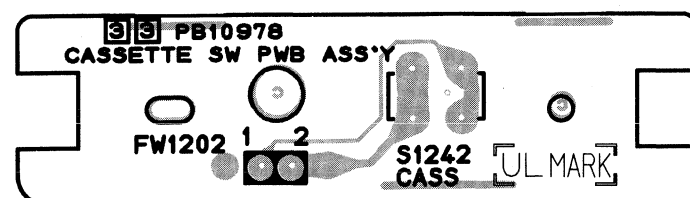


4.15 SW/DISPLAY, SW/JACK, REC SAFETY AND CIRCUIT BOARDS

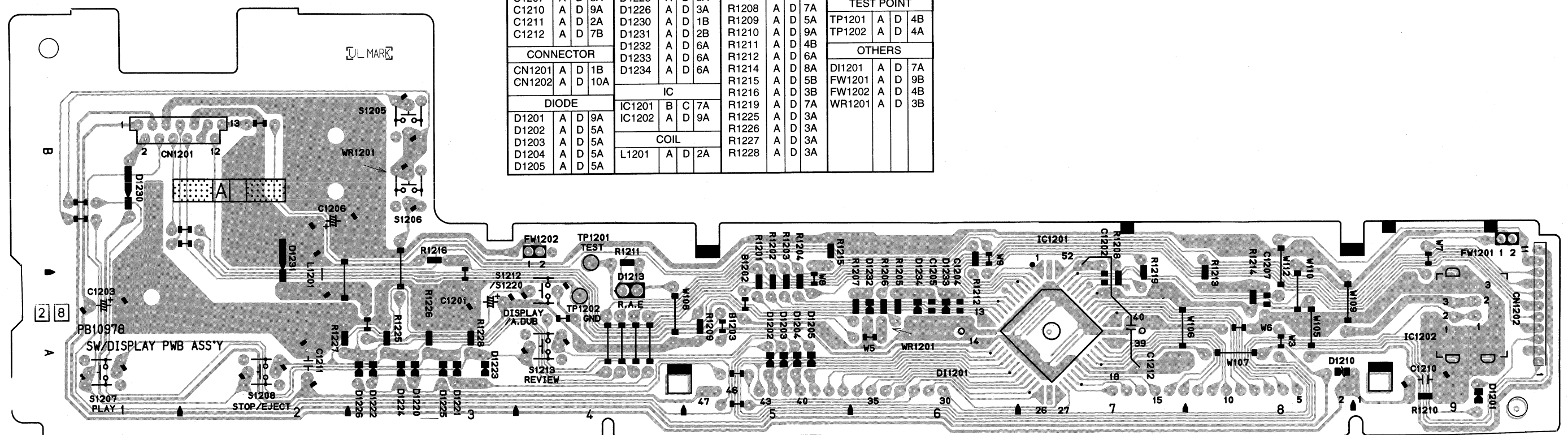
-REC SAFETY-



-CASSETTE SW-



–SW/DISPLAY–



COMPONENT PARTS LOCATION GUIDE

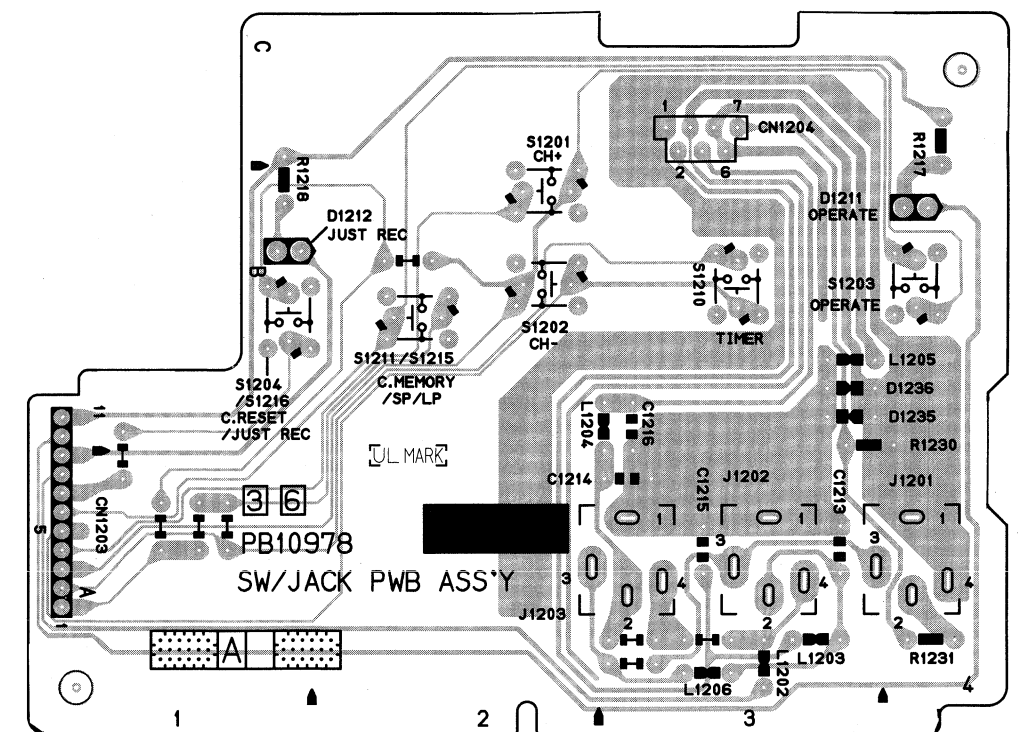
<SW/JACK PWB>

REF.No.	LOCATION			REF.No.	LOCATION		
CAPACITOR				RESISTOR			
C1213	A	D	3A	R1217	A	D	4C
C1214	A	D	3A	R1218	A	D	1B
C1215	A	D	3A	R1230	A	D	4B
C1216	A	D	3B	R1231	A	D	4A
CONNECTOR				SWITCH			
CN1203	A	D	1A	S1201	A	D	2B
CN1204	A	D	3C	S1202	A	D	2B
				S1203	A	D	1B
DIODE				S1204	A	D	4B
				S1210	A	D	3B
D1211	A	D	4B	S1211	A	D	2B
D1212	A	D	1B	S1241	A	D	5A
D1235	A	D	4B	OTHERS			
D1236	A	D	3B				
COIL				J1201	A	D	4A
L1202	A	D	3A	J1202	A	D	3A
L1203	A	D	3A	J1203	A	D	3A
L1204	A	D	3B				
L1205	A	D	4A				
L1206	A	D	3A				

COMPONENT PARTS LOCATION GUIDE <SW/DISPLAY PWB>

REF.No.				LOCATION				REF.No.				LOCATION				REF.No.				LOCATION			
CAPACITOR								RESISTOR								SWITCH							
C1201	A	D	3A	D1210	A	D	8A	R1201	A	D	5A	S1205	A	D	3B								
C1202	A	D	7A	D1213	A	D	4A	R1202	A	D	5A	S1206	A	D	3B								
C1203	A	D	1A	D1220	A	D	3A	R1203	A	D	5A	S1207	A	D	1A								
C1204	A	D	6A	D1221	A	D	3A	R1204	A	D	5A	S1208	A	D	2A								
C1205	A	D	6A	D1222	A	D	3A	R1205	A	D	6A	S1212	A	D	4A								
C1206	A	D	2B	D1223	A	D	3A	R1206	A	D	6A	S1213	A	D	4A								
C1207	A	D	8A	D1224	A	D	3A	R1207	A	D	6A	TEST POINT											
C1210	A	D	9A	D1225	A	D	3A	R1208	A	D	7A												
C1211	A	D	2A	D1226	A	D	3A	R1209	A	D	5A	TP1201	A	D	4B								
C1212	A	D	7B	D1230	A	D	1B	R1210	A	D	5A	TP1202	A	D	4A								
CONNECTOR								D1231	A	D	2B	OTHERS											
								D1232	A	D	6A												
								D1233	A	D	6A												
CN1201	A	D	1B	D1234	A	D	6A	R1212	A	D	6A	D11201 A D 7A FW1201 A D 9B FW1202 A D 4B WR1201 A D 3B											
CN1202	A	D	10A	IC				R1214	A	D	8A												
DIODE								IC1201	B	C	7A					R1215	A	D	5B				
				IC1202	A	D	9A	R1216	A	D	3B												
COIL				L1201 A D 2A				R1219	A	D	7A												
								R1225	A	D	3A												
								R1226	A	D	3A												
								R1227	A	D	3A												
								R1228	A	D	3A												

-SW/JACK-

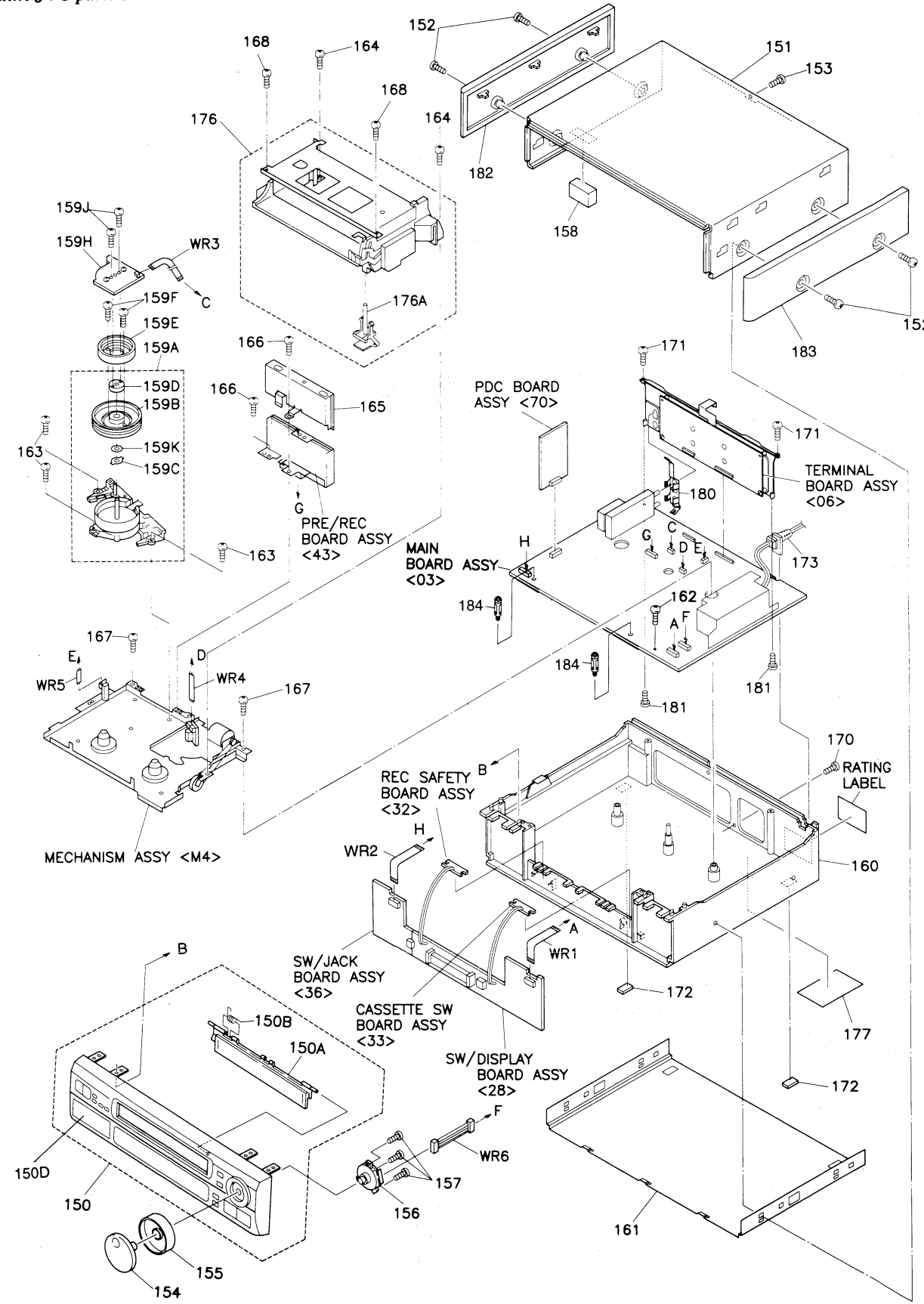


SECTION 5
PARTS LIST

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



#△ REF No. PART No. PART NAME, DESCRIPTION

CABINET AND CHASSIS ASSEMBLY <M2>

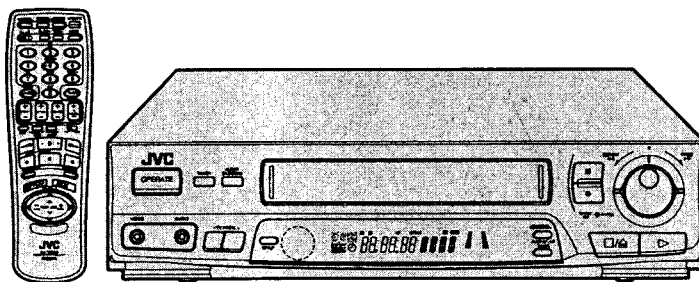
150	PQ11802AN	FRONT PANEL ASSEMBLY
150A	PQ21818-29	CASSETTE DOOR
150B	PQ46448	TORSION SPRING
150D	PQ21822-28	DOOR
△ 151	PQ11676-31	TOP COVER
152	PQ43930	SPECIAL SCREW, X4 TOP COVER (SIDE)
153	SDSF3010M	SCREW, TOP COVER (REAR)
154	PQ35247-5	KNOB (JOG)
155	PQ35295-5	KNOB (SHUTTLE)
156	PEME0757-03	JOG SHUTTLE ASSEMBLY
157	SDSF2608Z	SCREW, X3, JOG
158	PQM30029-244	SPACER
159A	PDM2282Q	DRUM SUB ASSEMBLY
159B	PDM3403D	UPPER DRUM ASSEMBLY
159C	PDM4400A	BRUSH ASSEMBLY
159D	PDM4345A	COLLAR ASSEMBLY
159E	PDZ0141-2	ROTOR ASSEMBLY
159F	SPSH2660Z	SCREW, X2
159J	SPSP2606Z	SCREW, X2
△ 159H	PDZ0141-1-2	STATOR ASSEMBLY
159K	PDM4050-10	WASHER
△ 160	PQ11666-3-14	BOTTOM CHASSIS
△ 161	PQ11668-2	BOTTOM COVER
162	SDSF3010Z	SCREW, MAIN
163	SPST2608Z	SCREW, X3 DRUM
164	SPST2610Z	SCREW, X2 CASS HOUS ASSY
165	PQ21740-1-1	SHIELD CASE, PRE
166	SDST2606Z	SCREW, X2 PRE
167	SDSF4012Z	SCREW, X2 MECH
168	SDSF3010Z	SCREW, X2 CASS HOUS ASSY
170	SDSF3010M	SCREW, TERMINAL
171	SDSF3010Z	SCREW, X2 TERMINAL
172	PQ43013-3	FOOT, X2
△ 173	QMP4A10-170	POWER CORD
176	PUS29724B-1	CASSETTE HOUSING ASSY
176A	PQ46359	CASSETTE SWITCH PIN
△ 177	PQ46485	SPACER (SAFETY)
180	PQ21623-1-2	EARTH PLATE (RF)
181	SDSF3008Z	SCREW, X2 EARTH PLATE
182	PQ11842	SIDE PANEL (L)
183	PQ11843	SIDE PANEL (R)
184	PEME0947-01-01	SPACER, X2 MECH
WR1	PW30802-1314	WIRE, SW/DISP CN1201
WR2	PW30802-0514	WIRE, SW/DISP
WR3	PW30803-0414	WIRE, DRUM
WR4	PW30101-C0HH887	WIRE, A/C HEAD
WR5	PW30101-P0HH882	WIRE, FE HEAD
WR6	PW30218-0831613	WIRE, JOG

JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J238E



SHOWVIEW

VHS
PAL

SPECIFICATIONS

GENERAL

Power requirement	: AC 220 – 240 V~, 50/60 Hz
Power consumption	: 20 W
Temperature	
Operating	: 5°C to 40°C
Storage	: -20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 340 mm
Weight	: 4.3 kg
Format	: VHS PAL standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette
(LP) [J438E only]	: 480 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines/50 fields
Recording system	: DA4 (Double Azimuth) head helical scan system (HR-J438E) Rotary two-head helical scan system (HR-J238E)
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz

Input/Output	: 21-pin scart connector x 2 (IN/OUT x 1, IN/DECODER x 1) RCA connector x 1 (IN x 1) [J438E only]
--------------	--

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position "AU")
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF 47 – 89/104 – 300/ 302 – 470MHz UHF 470 – 862MHz
Aerial output	: UHF channel 36 (Adjustable 32 – 40)
Memory backup time	: Approx. 60 min.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6" battery x 2
----------------------	--

*Specifications shown are for SP mode unless otherwise specified.
E. & O.E. Design and specifications subject to change without notice.*

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the  symbol and shaded (■) parts are critical for safety.

Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.

Caution for continued protection against fire hazard.

Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:

- 1) Wires covered with PVC tubing
- 2) Double insulated wires
- 3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:

- 1) Insulation Tape
- 2) PVC tubing
- 3) Spacers
- 4) Insulation sheets for transistors
- 5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

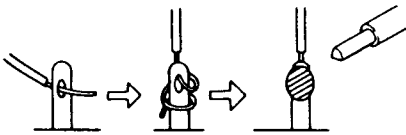


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

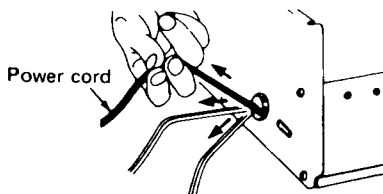


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)

In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

- 1) **Connector part number :** E03830-001

- 2) **Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.

- 3) **Replacement procedure**

- (1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).

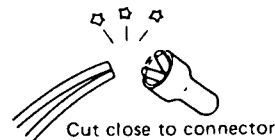


Fig. 3

- (2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

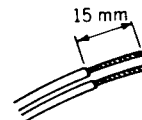


Fig. 4

- (3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

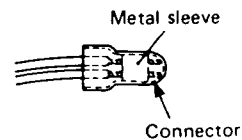


Fig. 5

- (4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

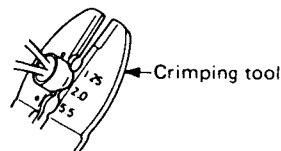


Fig. 6

- (5) Check the four points noted in Fig. 7.

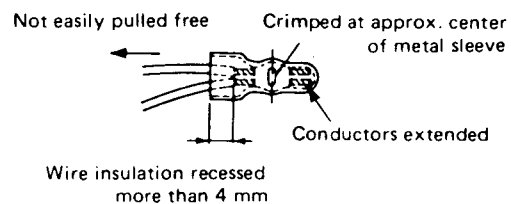


Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

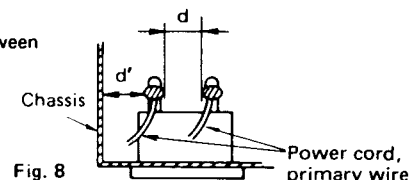


Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

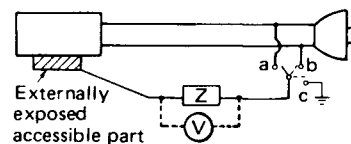


Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

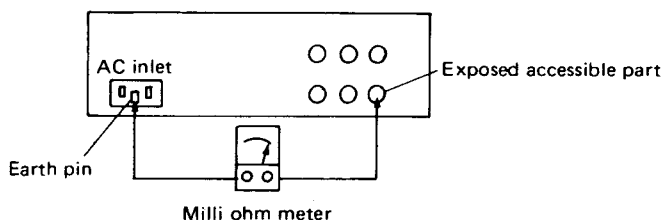


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega / 500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	—	AC 1 kV 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V	Europe & Australia	$R \geq 10 \text{ M}\Omega / 500 \text{ V DC}$	AC 3 kV 1 minute (Class II)	$d \geq 4 \text{ mm}$
200 to 240 V			AC 1.5 kV 1 minute (Class I)	$d' \geq 8 \text{ mm (Powercord)}$ $d' \geq 6 \text{ mm (Primary wire)}$

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	$0.15 \mu\text{F}$ and $1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	Europe & Australia	$2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
220 to 240 V		$50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

Safety Precautions

The rating plate and the safety caution are on the rear of the unit.

WARNING: DANGEROUS VOLTAGE INSIDE

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the mains outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the mains outlet prior to connecting or disconnecting any signal lead or aerial.

WARNING

There are two different types of SECAM colour systems: SECAM-L, used in FRANCE (also called SECAM-West), and SECAM-B, used in Eastern European countries (also called SECAM-East).

1. This recorder can also receive SECAM-B colour television signals for recording and playback.
2. Recordings made of SECAM-B television signals produce monochrome pictures if played back on a video recorder of SECAM-L standard, or do not produce normal colour pictures if played back on a PAL video recorder with SECAM-B system incorporated (even if the TV set is SECAM-compatible).
3. SECAM-L prerecorded cassettes or recordings made with a SECAM-L video recorder produce monochrome pictures when played back with this recorder.
4. This recorder cannot be used for the SECAM-L standard. Use a SECAM-L recorder to record SECAM-L signals.

For Italy:

"It is declared that this product, brand JVC, conforms to the Ministry Decree n. 548 of 28 Aug.'95 published in the Official Gazette of the Italian Republic n. 301 of 28 Dec.'95"



- Only cassettes marked "VHS" can be used with this videorecorder.
- HQ VHS is compatible with existing VHS equipment.
- ShowView is a trademark applied for by Gemstar Development Corporation. The ShowView system is manufactured under licence from Gemstar Development Corporation.

IMPORTANT

- Please read the various precautions on this page before installing or operating the recorder.
- It should be noted that it may be unlawful to re-record pre-recorded tapes, records, or discs without the consent of the owner of copyright in the sound or video recording, broadcast or cable programme and in any literary, dramatic, musical, or artistic work embodied therein.

The OPERATE button does not completely shut off mains power from the unit, but switches operating current on and off.

Video tapes recorded with this video recorder in the LP (Long Play) mode cannot be played back on a single-speed video recorder (J438E only).

Failure to heed the following precautions may result in damage to the recorder, remote control or video cassette.

1. **DO NOT** place the recorder . . .
 - ... in an environment prone to extreme temperatures or humidity.
 - ... in direct sunlight.
 - ... in a dusty environment.
 - ... in an environment where strong magnetic fields are generated.
 - ... on a surface that is unstable or subject to vibration.
2. **DO NOT** block the recorder's ventilation openings.
3. **DO NOT** place heavy objects on the recorder or remote control.
4. **DO NOT** place anything which might spill on top of the recorder or remote control.
5. **AVOID** violent shocks to the recorder during transport.

MOISTURE CONDENSATION

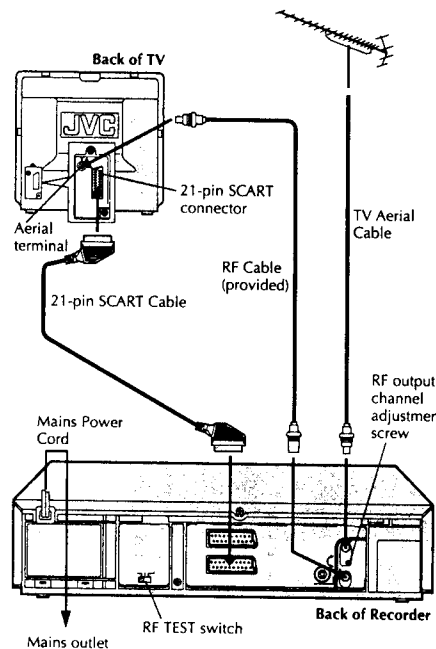
Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions—just as water droplets form in the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the recorder turned on for a few hours to let the moisture dry.

ABOUT HEAD CLEANING

Accumulation of dirt and other particles on the video heads may cause the playback picture to become blurred or interrupted. Be sure to contact your nearest JVC dealer if such troubles occur.

INSTALLING YOUR NEW RECORDER

Basic Connections



It's essential that your video recorder be properly connected. Follow these steps carefully. THESE STEPS MUST BE COMPLETED BEFORE ANY VIDEO OPERATION CAN BE PERFORMED.

CHECK CONTENTS

Make sure the package contains all of the accessories listed in "Specifications" (pg. 35).

SITUATE RECORDER

Place the recorder on a stable, horizontal surface.

CONNECT RECORDER TO TV

The connection method you use depends on the type of TV you have.

RF CONNECTION

- To Connect To A TV With NO AV Input Terminals . . .
 - a- Disconnect the TV aerial cable from the TV.
 - b- Connect the TV aerial cable to the ANT. IN jack on the rear panel of the recorder.
 - c- Connect the provided RF cable between the RF OUT jack on the rear panel of the recorder and the TV's aerial terminal.

Before operating the recorder, make sure the TV's channel is set to the VIDEO channel.

AV CONNECTION

- To Connect To A TV With AV Input Terminals . . .
 - a- Connect the aerial, recorder and TV as per "RF CONNECTION".
 - b- Connect an optional SCART cable between the AV1 IN/OUT socket on the rear panel of the recorder and the TV's 21-pin SCART connector.
 - c- Set the RF TEST switch to OFF.

Before operating the recorder, make sure the TV is set to the VIDEO (or AV) mode.

CONNECT RECORDER TO MAINS

- 4 Plug the end of the mains power cord into a mains outlet.

The video recorder sends picture and sound signals via the RF connecting cable to your TV on UHF channel 36.

TURN ON THE RECORDER

Press **OPERATE**.

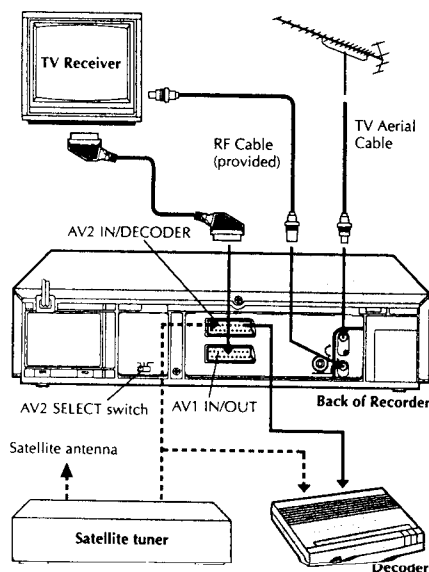
SELECT OUTPUT MODE

Set the **RF TEST** switch on the back of the recorder to ON.

Tune The TV To Your Video Recorder

CONTINUED ON NEXT PAGE.

Connecting/ Using A Decoder



SET TV CHANNEL

3 Set your TV to the video channel (UHF channel 36). Two white bars appear on screen vertically.

- Tune the TV until the bars are as clear as they can be.
- Your TV should be set to the channel designated for use with a video recorder, or to a spare channel if there is not a specified video channel on your TV.

RESET OUTPUT MODE

4 Return the RF TEST switch to OFF.

NOTES:

- If CH36 is occupied by a local station, adjust the RF output channel adjustment screw to use another channel between CH32 and CH40 instead.
- If some interference noise is continually seen on the screen, consult your JVC dealer.

The AV2 IN/DECODER connector can be used as an input terminal for an external decoder (descrambler). Simply connect a decoder and you can enjoy the variety of programming that is available through scrambled channels.

SELECT INPUT MODE

1 Set the AV2 SELECT switch to "DECODER".

CONNECT DECODER

2 Connect your recorder's AV2 IN/DECODER connector to the decoder's Euroconnector using a 21-pin SCART cable.

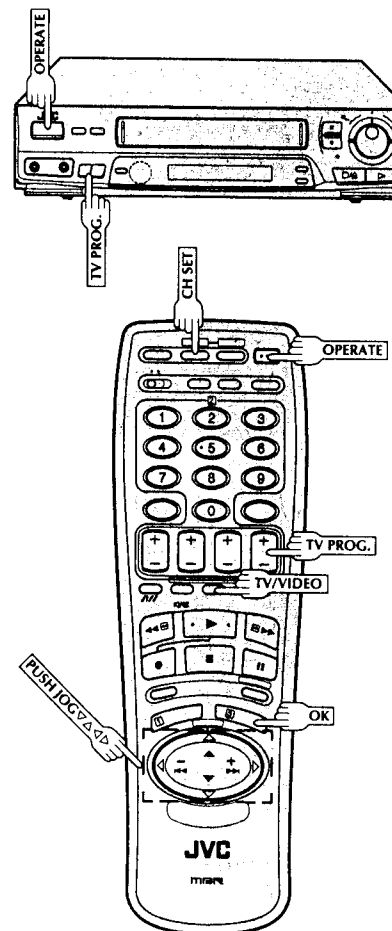
SET TUNER

3 Follow the procedure starting on page 5.

NOTES:

When Connecting A Satellite Tuner . . .
 . . . connect it to the decoder, or if you don't have a decoder connect the satellite tuner directly to the video recorder.
 . . . set the AV2 SELECT switch to "AV2".
 . . . to view a programme via the satellite tuner, select AU 2 mode by pressing TV PROG. until "AU 2" appears on the display panel.

Tuner Set



Your recorder needs to memorise all necessary stations in channel positions in order to record TV programmes. ATS+ (Auto Tuning System) automatically assigns all receivable stations in your area to call them up with the TV PROG. buttons without going through any vacant channels.

The following procedure describes how to select automatic channel setting.

TURN ON THE RECORDER

Press OPERATE.

- If your recorder is connected to the TV via AV connection, press TV/VIDEO to select the VIDEO mode.

ACCESS LANGUAGE SCREEN

2 Press and hold CH SET for more than 2 seconds. The Language screen appears.

SELECT LANGUAGE

3 Press PUSH JOG/Δ/▽ to place the pointer next to the language of your choice, then press OK to enter your selection. The Ch. Set menu menu appears.

ENGLISH
DEUTSCH
FRANCAIS
ITALIANO
CASTELLANO
NEDERLANDS
SVENSKA
NORSK
SUOMI
DANSK
[Δ/▽] → CES

SELECT MODE

4 "AUTO CH SET" is the necessary mode for this procedure, so simply press OK to enter the selection. The Country select screen appears.

AUTO CH SET
MANUAL CH SET
GUIDE PROG SET
[Δ/▽] → CES
[CANCEL] : EXIT

SELECT COUNTRY

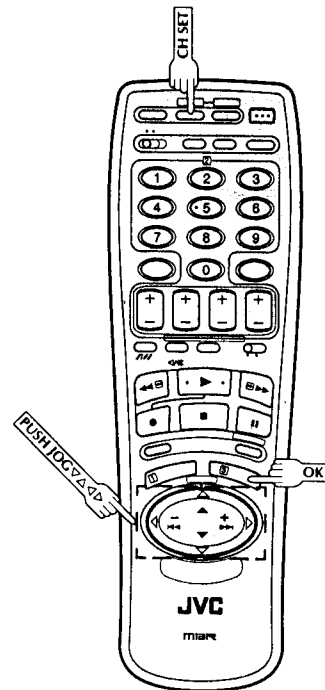
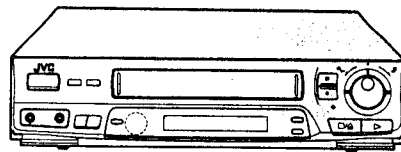
5 Press PUSH JOG/Δ/▽ to place the pointer next to your country's name, then press OK to initiate Auto Channel Set.

- As the recorder searches for receivable stations, it displays broadcasts from the stations for a few seconds as it locates them.

ÖSTERREICH
BELGIUM
DEUTSCHLAND
DANMARK
ESPAÑA
GREECE
ITALIA
NEDERLAND
NORSK
PORTUGAL
SUISSE
SUOMI
SVERIGE
OTHERS
[Δ/▽] → CES : AUTO CH SET
[CANCEL] : EXIT

AUTO CH SET
PLEASE WAIT
[CANCEL] : EXIT

CONTINUED ON NEXT PAGE.



VIEW CONFIRMATION SCREEN

6

The stations your recorder located appear on a Confirmation screen — channel positions (PR), channels (CH) and station names (ID— pg. 31). To view the next page of the listing, press **PUSH JOG** Δ ∇ $\leftarrow$ $\rightarrow$. The blueback screen and the program currently being broadcast by the highlighted station appear alternately for 5 seconds each.

PR	CH	ID	PR	CH	ID
01	25	ARD	08	C26	E-SP
02	C08	SRV1	09	55	WEST
03	10	ZDF	10	C24	SAT1
04	C05	RAI1	11	C23	OSF
05	C31	BBC1	12	C25	ESPN
06	C32	BB2	13	C37	CNN
07	C33	SSAT	14	C35	

[A] Δ ∇ $\leftarrow$ $\rightarrow$: NEXT PAGE
 [OK] : EDIT
 [C] : CANCEL : DELETE
 [CH SET] : EXIT

- The stations located in the selected country appear at the top of the list.

RETURN TO NORMAL SCREEN

7

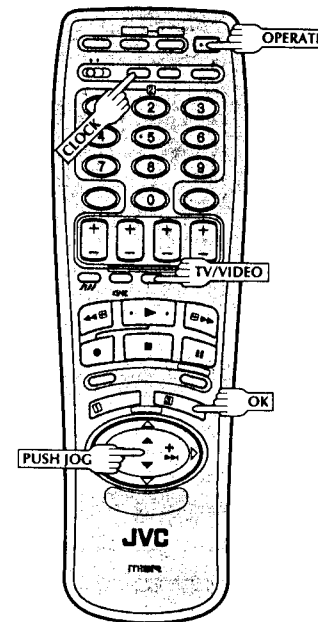
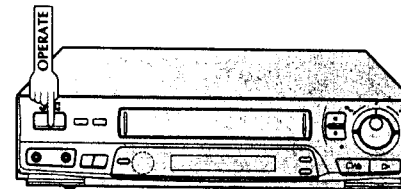
Press **CH SET**.

- Depending on the reception conditions, the stations may not be stored in order, and the station names may not be stored correctly.
- Using the Confirmation screen, you can skip or add channel positions, enter station names and perform other operations. Refer to page 29 for the procedures.
- For information on scrambled broadcasts, refer to page 29.

NOTES:

- Fine tuning is performed automatically when you select "AUTO CH SET". If you want to perform it manually, refer to page 30.
- To set the tuner manually, refer to "Storing Channels Manually" (pg. 29).

Clock Set



If you performed Auto Channel Set (pg. 5), the recorder's built-in clock is also set automatically. The Auto and Manual clock setting procedures are necessary when . . .

- a power outage of more than 60 minutes occurs.
- the tuner has been set manually.
- the user desires to set the clock slightly ahead of the actual time.
- the clock was not set even after Auto Tuner Set was performed.

Whether you perform Auto or Manual clock setting, you can use the convenient Just Clock function.

Just Clock

The Just Clock function provides accurate time keeping through automatic adjustments at regular intervals, by reading data from a PDC signal.

The Just Clock option appears in the Clock Set and Auto Clock screens, and can be set "ON" or "OFF" (the default setting is "ON"). Press **OK** until the Just Clock setting begins blinking, then press **PUSH JOG** Δ ∇ to change the setting.

IMPORTANT: If you turn off Just Clock off, the accuracy of your recorder's built-in clock may be reduced, which could adversely effect timer recording.

Both Auto and Manual clock setting procedures begin from step 3.

Preparation

TURN THE RECORDER ON

1

Press **OPERATE**.

- If your recorder is connected to the TV via AV connection, press **TV/VIDEO** to select the VIDEO mode.

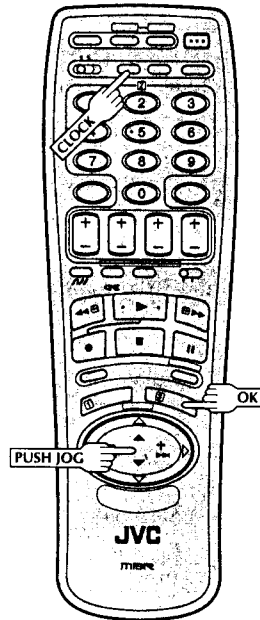
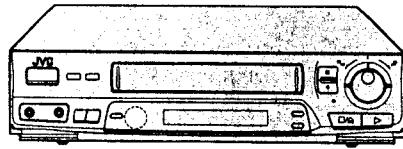
ACCESS CLOCK SET SCREEN

2

Press **CLOCK** on the remote control. The Clock Set screen appears.

CLOCK SET			
TIME	DATE	01	01
08:00	01	01	00
JUST CLOCK: ON			
TV PR.			
[>]: AUTO CLOCK			
[A] Δ ∇ : GOS			
[CLOCK] : EXIT			

CONTINUED ON NEXT PAGE.

**NOTES:**

- Just Clock (when set to "ON") enables adjustment of the recorder's built-in clock every hour on the hour, except for 11 o'clock in the evening and midnight.
- Just Clock is not effective when...
 - the recorder's power is on (unless the recorder is tuned to the same channel position selected in the Clock Set screen), the recorder is in the Timer mode.
 - a difference of more than 3 minutes exists between the built-in clock's time and the actual time.
- The recorder's clock is automatically adjusted at the start/end of Summer Time.
- Auto clock setting and Just Clock may not function properly depending on the reception condition.
- During Manual clock setting, if the day and month data are invalid (such as 31st April), the month digits are cleared automatically and the day digits begin blinking. Input the correct data.
- If, in step 3 of the Manual clock setting procedure, the year digits are automatically cleared and the day digits begin blinking, it is possible that you have input 29th February for a non-leap year. Input the correct data.

Auto Clock Set**SET CLOCK AUTOMATICALLY**

At the Clock Set screen press **PUSH JOG** ▽. The Auto Clock screen appears and clock setting begins.

AUTO CLOCK
 ≧ PLEASE WAIT ≦
 JUST CLOCK: ON
 TV PR. 1

- If "TV PR." isn't set to the channel position on which Auto Clock data is received, "ERROR" appears, and then the screen from step 2 reappears. To set "TV PR.", press **OK** to place the pointer next to it, then cycle through the numbers by pressing **PUSH JOG** ▽ until the number representing the channel position in which the station transmitting clock setting data is stored appears.

RETURN TO NORMAL SCREEN

Once clock setting is completed, press **CLOCK** to return to the normal screen.

Manual Clock Set**SET DATE AND TIME**

Press **PUSH JOG** ▽ to set the hour, then press **OK**. The "minutes" display begins blinking. Repeat the procedure to set the minutes, day, month and year.

SET JUST CLOCK

The default setting is "ON". Set as desired by pressing **PUSH JOG** ▽, then press **OK**.

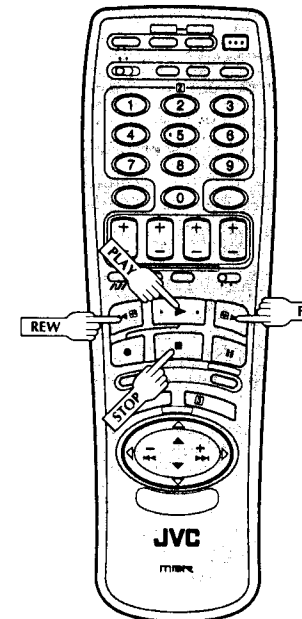
- If you set to "OFF", you can disregard the next step as you won't be able to receive regular clock adjustments.

SET CLOCK DATA SOURCE CHANNEL POSITION

The recorder is preset to receive clock setting and adjustment data from channel position 1. Press **PUSH JOG** ▽ to set the channel position to the number representing the station transmitting clock setting data, then press **OK**.

START CLOCK OPERATION

Press **CLOCK**.

Basic Playback

The easiest, most basic operation possible with your video recorder is tape playback. Already-recorded signals on a video tape are read by your video recorder and displayed on your TV just like a TV programme.

LOAD A CASSETTE

Make sure the window side is up, the rear label side is facing you and the arrow on the front of the cassette is point toward the recorder. Don't apply too much pressure when inserting.

- The recorder power comes on automatically and the counter is reset to 0:00:00.
- If the record safety tab has been removed, playback begins automatically.

FIND PROGRAMME START POINT

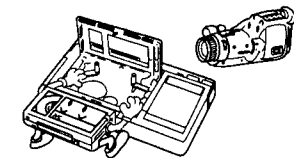
If the tape is advanced past the start point, press **REW** or turn the **SHUTTLE** ring to the left and release it. To go forward, press **FF** or turn the **SHUTTLE** ring to the right and release it.

START PLAYBACK

Press **PLAY**. "BEST" appears blinking in the recorder's display panel for 5 seconds. (☞ pg. 15)

STOP PLAYBACK

Press **STOP** on the remote or **STOP/EJECT** on the recorder's front panel. Then press **STOP/EJECT** to remove the cassette.

Usable cassettes

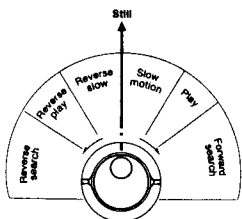
- Compact VHS camcorder recordings can be played on this video recorder. Simply place the recorded cassette into a VHS Cassette Adapter and it can be used just like any full-sized VHS cassette.
- This video recorder can record on regular VHS and Super VHS cassettes. However, it will record and play back regular VHS signals only. It is not possible to play back a recorded Super VHS tape.

Playback Features

Take advantage of special functions possible with the recorder's controls or the remote control.

NOTE:

Refer to the **SHUTTLE** ring illustration below as you read the following procedures.



Still Picture/Frame-By-Frame Playback

1 PAUSE DURING PLAYBACK

Press **PAUSE**. If there is vertical jitter, use the **TV PROG.** buttons to correct the picture.

2 ACTIVATE FRAME-BY-FRAME PLAYBACK

Turn the **JOG** dial to the right for forward frame-by-frame playback, or to the left for reverse frame-by-frame playback. [J438E only]

OR

Press **PAUSE**.

OR

Press **PUSH JOG** < or >.

To resume normal playback, press **PLAY**.

Slow Motion

1 ACTIVATE SLOW-MOTION PLAYBACK

During playback or still, turn the **SHUTTLE** ring to the right for forward slow motion, or to the left for reverse slow motion (refer to the illustration to the left).

OR

During still picture, press **PAUSE** and hold for 2 seconds, then release. Press and release again to return to still picture.

OR

During still picture, press and hold **PUSH JOG** < or >. Release to return to still picture.

To resume normal playback, press **PLAY**.

Variable-Speed Search

1 ACTIVATE VARIABLE-SPEED SEARCH

During playback or still, turn the **SHUTTLE** ring to the right for forward variable-speed search, or to the left for reverse variable-speed search (refer to the illustration to the left).

OR

During playback, press **PUSH JOG** < or >.

- The more times you press, the faster the playback picture moves.
- To decrease speed, press the button for the opposite direction.

To resume normal playback, press **PLAY**.

High-Speed (Turbo) Search

1 ACTIVATE HIGH-SPEED SEARCH

During playback or still, turn the **SHUTTLE** ring all the way to the right for forward high-speed search, or to the left for reverse high-speed search.

- For forward search with a visible picture, turn the **SHUTTLE** ring all the way to the right and release it within 1 second.
- For reverse search with a visible picture, turn the **SHUTTLE** ring all the way to the left and release it within 1 second.

OR

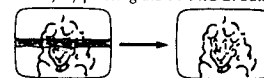
Press **FF** for forward high-speed search, or **REW** for reverse high-speed search.

- For short searches, press and hold **FF** or **REW** for over 2 seconds. When released, normal playback resumes.

To resume normal playback, press **PLAY**.

Manual Tracking

Your video recorder is equipped with automatic tracking control. During playback, you can override this and adjust the tracking manually by pressing the **TV PROG.** buttons.



1 OVERRIDE AUTOMATIC TRACKING

Press **SP/LP (///)** on the remote to engage manual tracking.

2 ADJUST TRACKING MANUALLY

Press **TV PROG.** + or - to adjust tracking.

3 RETURN TO AUTOMATIC TRACKING

Press **SP/LP (///)** on the remote to re-engage automatic tracking.

NOTE:

When a new tape is inserted, the recorder enters the automatic tracking mode automatically.

Instant ReView

Simply by pressing a single button, the recorder power comes on, rewinds, and begins playback of the last timer-recorded programme. If you have several programmes recorded, you can easily access any of them.

NOTE:

Before starting, make sure that the recorder is off and that the **Timer** mode is disengaged.

1 ACTIVATE INSTANT REVIEW

Press **REVIEW**. The recorder power comes on and the recorder searches for the index code indicating the start of the last timer-recorded programme. Once it's found, playback begins automatically. The front display panel tells you how many programmes have been recorded. If you have, for example, 3 programmes, "REV 3" appears and blinks. To watch the first of the 3 programmes, press **REVIEW** three times. The recorder searches and begins playback automatically. You can access a programme as far as 9 index codes away from the current tape position.

NOTES:

- Instant ReView is not possible while the recorder is in the **Timer** mode.
- The number displayed to the right of "REV" may not match the actual number of timer-recorded programmes when one or more of them is a **PDC/VPS** recording (pg. 24).

Repeat Playback

Your video recorder can automatically play back the whole tape 20 times repeatedly.



1 START PLAYBACK

Press **PLAY**.

2 ACTIVATE REPEAT PLAYBACK

Press **PLAY** and hold for over 5 seconds, then release.

- The Play indicator (▶) on the display panel blinks slowly.
- The tape plays 20 times automatically, and then stops.

3 STOP PLAYBACK

Press **STOP** at any time to stop playback.

NOTE:

Pressing **PLAY**, **REW**, **FF** or **PAUSE** also stops Repeat Playback.

NTSC Playback

Your video recorder is equipped with NTSC circuitry that can play back NTSC tapes.

1 LOAD A CASSETTE

Insert a cassette recorded in NTSC.

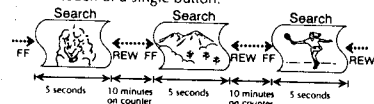
2 START PLAYBACK

Press **PLAY**. "NT" appears on the display panel.

- Some TVs shrink the picture vertically and place black bars at the top and bottom of the screen. This is not a malfunction on the part of either the video recorder or the TV.
- The picture may roll up and down. This can be corrected using the **V-HOLD** control found on some TVs. (This cannot be corrected if the TV does not have a **V-HOLD** control.)
- The counter and tape remaining time readings will be incorrect.
- During search, still, or frame-by-frame playback, the picture will be distorted, and there may be a loss of colour.
- Depending on the type of TV, the top and bottom portions of superimposed displays may be cut off during NTSC playback.

Scene Finder

This function helps you check contents of unlabeled recorded tapes at the touch of a single button.



NOTES:

- Scene Finder cannot be used when the recorder is in the Record mode.
- If your recorder is connected to the TV using an AV connection, press TV/VIDEO to select the VIDEO mode.

1 ACTIVATE SCENE FINDER

Press **SCENE FINDER**. The recorder starts forward high-speed search for 5 seconds and then fast-forwards 10 minutes on the counter. This cycle is repeated until the end of the tape is reached.

- To start Scene Finder in the reverse direction, press **SCENE FINDER** and then turn the **SHUTTLE** ring to the left (or press the remote's **REW** button) within 2 seconds. This cycle is repeated until the beginning of the tape.
- During Scene Finder, the following indications appear on the display panel:



2 STOP SCENE FINDER

Press **STOP**.

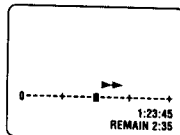
NOTES:

- During Scene Finder high-speed search, you can also hear the tape sound. During fast forward or rewind, you hear the current TV sound instead.
- Scene Finder does not function during Index Search.

Tape Position Indicator

The tape position indicator appears on screen when, from the Stop mode, you press **FF**, **REW** or perform an Index Search. The position of "■" in relation to "0" (beginning) or "+" (end) shows you where you are on the tape.

"O.S.D." (pg. 17) must be set to "ON", or the indicator will not appear.

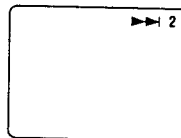


NOTE:

Depending on the type of tape used, there may be times when the indication is not correct.

Index Search

Your recorder automatically marks index codes at the beginning of each recording. This function gives you quick access to any one of 9 index codes in either direction.



NOTE:

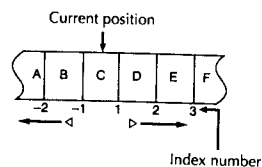
Before starting, make sure the recorder is in the Stop mode.

1 ACTIVATE INDEX SEARCH

Press **PUSH JOG** ◀ or ▶ (◀◀ or ▶▶). "◀◀ 1" or "▶▶ 1" is displayed on screen and search begins in the corresponding direction.

- To access index codes 2 through 9, press **PUSH JOG** ◀ or ▶ repeatedly until the correct index number is displayed.

Ex.: To locate the beginning of B from the current position, press **PUSH JOG** ◀ twice.
To locate the beginning of D from the current position, press **PUSH JOG** ▶ once.



- When the specified index code is located, playback begins automatically.

Next Function Memory

You can set your recorder's power to go off automatically after the tape is fully rewound. Before starting, make sure the recorder is in the Stop mode.
For Automatic Power Off After Tape Rewind . . .
... press **REW**, then press **OPERATE** within 2 seconds.

NOTE:

If you want the power to be turned off automatically when the counter reads "0:00:00" (instead of at the beginning of the tape), press **C.MEMORY** so that the "M" mark appears before pressing **REW**.

Tape Remaining Time

1 DISPLAY REMAINING TIME

Press **DISPLAY** until the time remaining on the tape appears.

- By pressing the **DISPLAY** button, you can change the display to show the counter reading, tape remaining time, or clock time.

NOTE:

- Depending on the type of tape used, there may be times when the tape remaining time reading may not appear right away, or is not correct. ":-:" may sometimes appear, or the display may blink on occasion.

Counter Memory

Returns to the counter reading of "0:00:00" to conveniently find a specific place on the tape automatically.

1 SET COUNTER MEMORY

Press **C. RESET** during playback at a point you wish to locate later. The counter reads "0:00:00". Then press **C. MEMORY**, and "M" appears in front of the counter digits.

2 ACTIVATE COUNTER MEMORY

When you wish to return to the designated point, press **STOP** and then **REW** or **FF**.

- The tape rewinds or fast-forwards and stops at about 0:00:00 automatically.
- To cancel Counter Memory, press **C.MEMORY** again.

Information On Colour System

You can also record SECAM signals, or play back a MESECAM tape on this recorder. When a MESECAM tape is played back, "MES" appears on the display panel. MESECAM is the designation for tapes with SECAM signals that have been recorded on a MESECAM-compatible PAL video recorder.

Remote A/B Code Switching

The remote control is capable of controlling two JVC video recorders independently; one set to respond to the remote control's A code control signals and another set to respond to B code control signals. The remote control is preset to send A code signals because your video recorder is initially set to respond to A code signals. You can easily modify your video recorder to respond to B code signals.

1 REMOVE POWER SUPPLY

Unplug the mains power cord from the mains outlet.

2 SET A/B CODE SWITCH

Set to B.

3 RE-SUPPLY POWER

Plug the mains power cord back into the mains outlet.

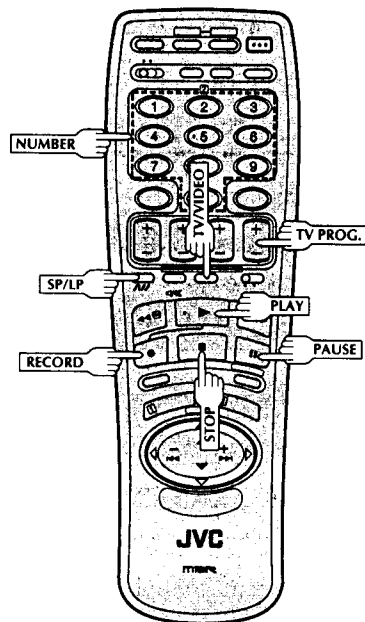
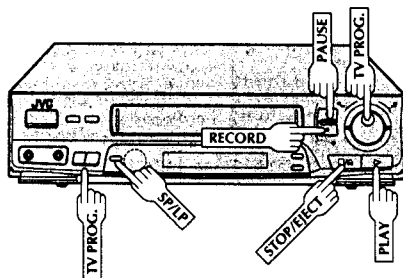
4 TURN THE RECORDER ON

Press **OPERATE** on the remote control. The recorder will now only respond to B code signals.

NOTE:

Some TV sets may malfunction in response to the B mode. If this happens, switch back to the A mode.

Basic Recording



TV signals being received by the recorder's built-in tuner can be recorded onto a video tape. You can "capture" a TV programme using your video recorder.

LOAD A CASSETTE

Insert a cassette with the record safety tab intact.

- The counter is reset to 0:00:00 and the recorder power comes on automatically.
- If your recorder is connected to the TV via AV connection, press TV/VIDEO to select the VIDEO mode.

CHOOSE A PROGRAMME

Press TV PROG, +/- or the NUMBER keys to select the channel you wish to record. The name of the station appears in the recorder's display panel for 5 seconds, followed by the channel position number. (Only stations that appear in the Confirmation screen will be displayed.)

- The TV PROG. dial can also be used to select a channel. [J438E only]

SET TAPE SPEED (J438E ONLY)

Press SP/LP. Check the SP/LP indicator on the recorder display panel to confirm the selected tape speed.

START RECORDING

Press and hold RECORD and PLAY on the remote control, or press RECORD on the recorder.

B.E.S.T. takes place at the beginning of both the first SP and the first LP recording after inserting the cassette (→ pg. 15).

PAUSE/RESUME RECORDING

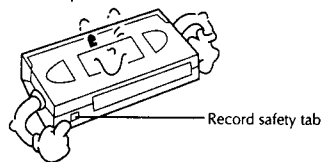
Press PAUSE. Press PLAY to resume recording.

STOP RECORDING

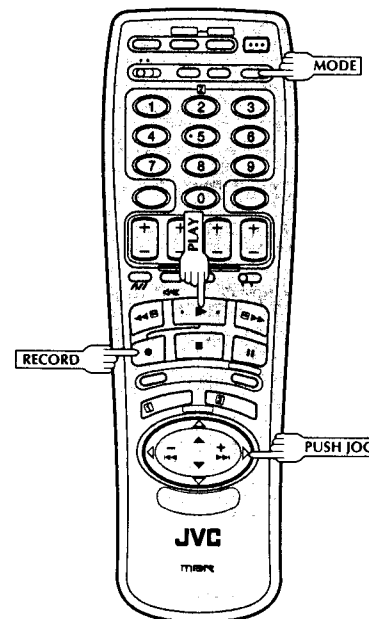
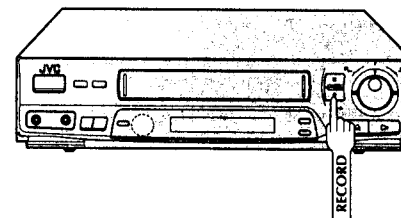
Press STOP on the remote control or STOP/EJECT on the recorder. Then press STOP/EJECT to remove the cassette.

Accidental erasure prevention

- To prevent accidental recording on a recorded cassette, remove its safety tab. To record on it later, cover the hole with adhesive tape.



B.E.S.T. Picture System



The B.E.S.T. (Biconditional Equalised Signal Tracking) system checks the condition of the tape in use during recording and playback, and compensates to provide the highest-possible recording and playback pictures. The default setting for both recording and playback is "ON".

Recording

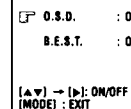
LOAD A CASSETTE

Insert a cassette with the record safety tab intact.

- The recorder power comes on automatically.

ACCESS MODE SELECT SCREEN

Press MODE. The O.S.D./B.E.S.T. screen appears.



CONFIRM B.E.S.T. STATUS

The default setting is "ON". If this is the case, go to step 4. If not, press PUSH JOG< to place the pointer next to "B.E.S.T.", then press PUSH JOG> to set to "ON".

CLOSE MODE SELECT SCREEN

Press MODE.

START RECORDING

Press and hold RECORD and PLAY on the remote, or press RECORD on the recorder.

- The recorder spends approximately 7 seconds assessing the condition of the tape, then begins recording.
- When the "BEST" indicator begins blinking, that means adjustment is complete.

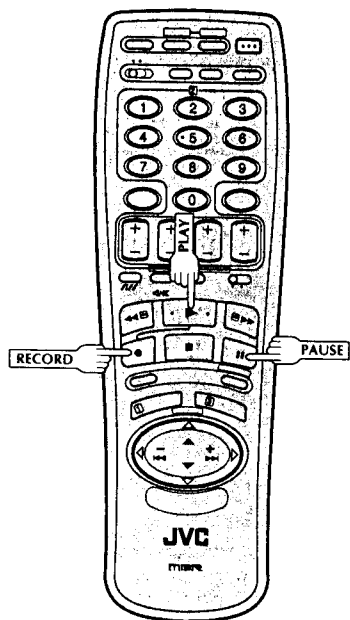
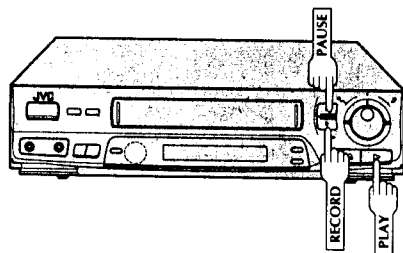
Display Panel Indication



As the tape check progresses, the "—" marks on the display panel increase upward. Once the "BEST" indicator starts blinking, the check is complete.

NOTES:

- The B.E.S.T. system works for both SP and LP modes only after a tape has been inserted and the Record mode is first initiated. It does not work during recording.
- In the case of timer recording, the B.E.S.T. system works before recording is initiated.
- Once the cassette is ejected, the B.E.S.T. data is cancelled. The next time the cassette is used for recording, B.E.S.T. is re-performed.



ATTENTION:

Since the B.E.S.T. system works before recording actually starts, there is a delay of approximately 7 seconds after RECORD and PLAY on the remote are pressed, or RECORD on the recorder is pressed. To make sure you record the desired scene or programme in its entirety, first perform the following steps:

- 1) Press and hold PAUSE and RECORD to engage the RECORD PAUSE mode.
 - The recorder then automatically checks the condition of the tape and, after approximately 7 seconds, re-enters RECORD PAUSE.
- 2) Press PLAY to start recording.
 - If you want to bypass the B.E.S.T. system and begin recording immediately, set "B.E.S.T." to "OFF" in step 3 on page 15.

Playback

The recorder assesses the quality of the tape once you initiate playback.

When watching a tape recorded with "B.E.S.T." set to "ON", it is recommended that you leave B.E.S.T. on during playback as well.

START PLAYBACK

- 1 Press PLAY.

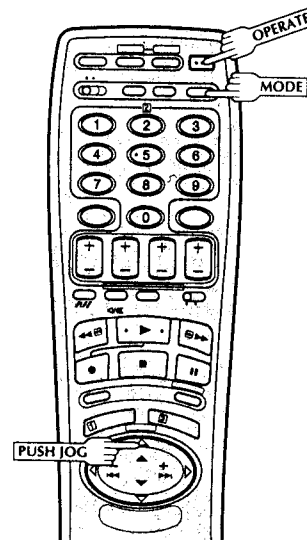
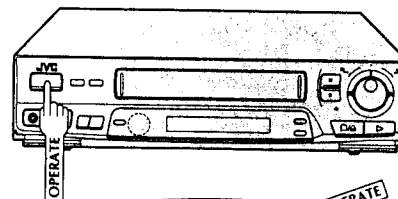


- The recorder adjusts the playback picture quality based on the quality of the tape in use.
- B.E.S.T. is active during Auto Tracking. "BEST" appears blinking on the recorder's display panel.

NOTES:

- When watching a rental tape, or one recorded on another video recorder, set B.E.S.T. to your preference by performing steps 2 through 4 on page 15.
- "BEST" only appears at the beginning of automatic tracking. Even though it doesn't appear after that, the B.E.S.T. function is operative.

On-Screen Displays



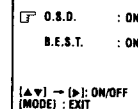
You can choose whether or not to have various operational indicators appear on screen, by setting this function ON or OFF. Messages appear in the language you selected during Auto Channel Set (see pg. 5).

TURN ON THE RECORDER

Press OPERATE.

ACCESS MODE SELECT SCREEN

Press MODE. The O.S.D./B.E.S.T. screen appears.



SELECT MODE

The pointer should already be next to "O.S.D.". If not, press PUSH JOG Δ▽ to place it there.

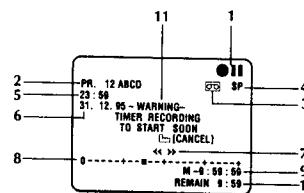
ENABLE/DISABLE ON-SCREEN DISPLAY

The default setting is "ON", so if you want on-screen displays, leave the setting as is and go to step 5. If you don't want the displays to appear, press PUSH JOG Δ▽ to set "O.S.D." to "OFF".

CLOSE MODE SELECT SCREEN

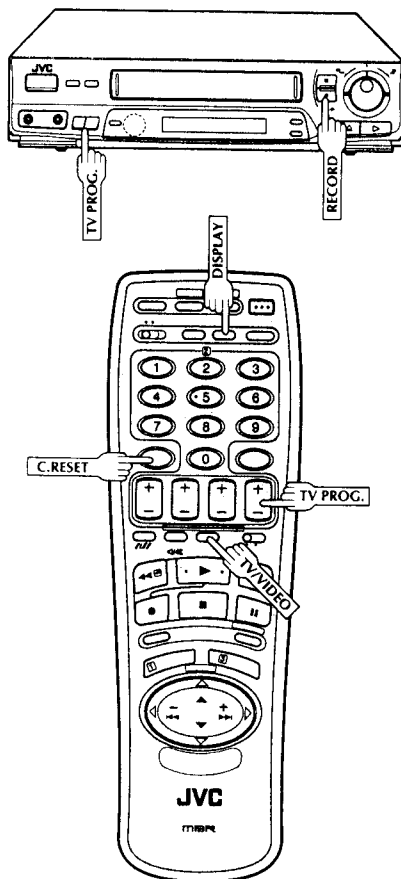
Press MODE.

The superimposed indication on the TV screen tells you what the recorder is doing.



- 1- Operation mode indicators
- 2- Channel position number and station name/Aux. indicator (AUX1, AUX2 or F-AUX (J438E only))
- 3- Cassette loaded mark
- 4- Tape speed SP/LP/EP (EP is for NTSC playback only) (J438E only)
- 5- Clock display
- 6- Current day/month/year
- 7- Tape direction
- 8- Tape position indicator (see pg. 12)
- 9- Counter display (including Counter Memory indicator)
- 10- Tape remaining time indicator
- 11- Timer warning display

Recording Features



Record One Programme While Watching Another

If your recorder is connected to the TV via AV connection, ... press TV/VIDEO. The recorder's VIDEO indicator and the TV broadcast being recorded disappear.

1 SELECT CHANNEL TO WATCH

Once recording is in progress, all you need to do is to set the channel controls on the TV for the station you wish to view.

- The programme selected with the TV's channel controls appears on the TV screen while the one selected with the TV PROG. button is recorded on the tape.
- If a decoder is connected to the recorder (pg. 4), you can select a scrambled channel as well with the TV channel controls.

Elapsed Recording Time Indication

You can check the exact time of a recording.

1 SET COUNTER DISPLAY

Press DISPLAY until a counter reading appears on the display panel.

2 RESET COUNTER

Press C. RESET before starting recording or playback.

- The counter is reset to "0:00:00" and shows the exact elapsed time as the tape runs.

Instant Timer Recording (ITR)

This easy method lets you record for from 30 minutes to 6 hours (selectable in 30-min. increments), and shuts the recorder off after recording is finished.

1 START RECORDING

Press RECORD on the recorder.

2 ENGAGE ITR MODE

Press RECORD again. ITR blinks and 0:30 appears on the front display panel.

3 SET RECORDING DURATION

If you want to record for more than 30 minutes, press RECORD to extend the time. Each press extends recording time by 30 minutes.

NOTE:

You can only perform ITR using the RECORD button on the recorder's front panel.

Information On ShowView

With ShowView, timer programming is greatly simplified because each TV programme has a corresponding code number which your recorder is able to recognise.

NOTE:

"Guide Prog. Number" (GUIDE PROG) refers to the assigned TV station numbers, according to broadcast area, for ShowView timer recording.

IMPORTANT

Perform the following procedure after the channel setting steps on pages 5 and 29 - 30, and after the Clock Set procedure on page 7.

After setting the Guide Prog. Numbers, the station names and channel positions may be incorrect if you stored or skipped channels. In this case, re-perform Guide Prog. Number setting.

Guide Prog. Number Set

1 MAKE LIST OF STORED STATION NAMES AND CHANNEL POSITIONS

(Ex.)

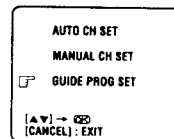
Channel position	Station name
1	ARD
2	ZDF
3	WDR

2 ACCESS CH. SET MODE MENU SCREEN

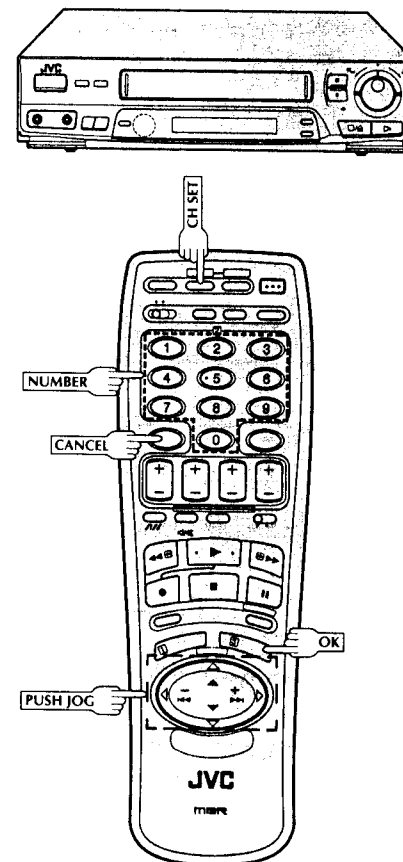
Press and hold CH SET for over 2 seconds. The Language screen appears. Press OK to access the Ch. Set Mode Menu screen.

3 SELECT MODE

Press PUSH JOG $\Delta \nabla$ to place the pointer next to "GUIDE PROG SET", then press OK. The Guide Prog. Set screen appears.



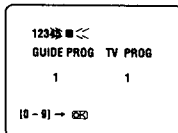
CONTINUED ON NEXT PAGE.



ENTER SHOWVIEW NUMBER

4

Press OK, and a cursor appears above "GUIDE PROG". Then, using the **NUMBER** keys, input the ShowView number (found in most TV listings) of a program scheduled to be broadcast on each station on the list from step 1, starting at the top. If you enter the wrong number, press **CANCEL** and input the correct number.



When entering a ShowView number for ARD

ENTER CHANNEL POSITION NUMBER

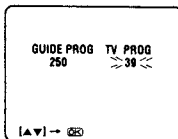
5

Press OK and the display under "TV PROG" begins blinking.

If the blinking number under "TV PROG" agrees with the channel position... press OK.

If the numbers do not agree...

...input the channel position using **PUSH JOG** or the **NUMBER** keys, then press OK.



- If you input the ShowView number of a program that has already aired, "ERROR" appears on screen for a few seconds. Input the correct ShowView number.
- Repeat steps 4 and 5 as necessary.

CLOSE MENU

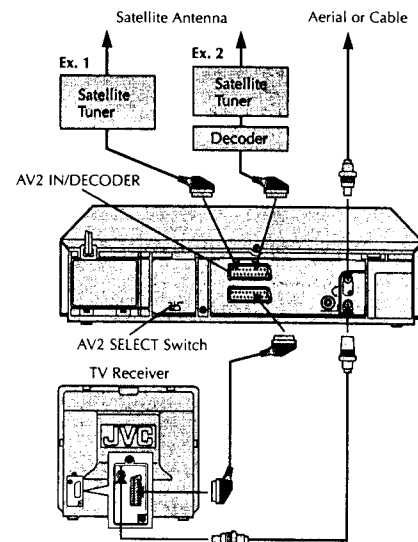
6

Press **CH SET** and selection is complete.

If you already know the Guide Prog. number for a station...

- 1- After step 3, press **PUSH JOG**.
 - The GUIDE PROG number begins blinking.
- 2- Enter the Guide Prog. number using the **NUMBER** keys or **PUSH JOG**, then press **PUSH JOG**.
 - The TV PROG number begins blinking.
- 3- Enter the channel position using the **NUMBER** keys or **PUSH JOG**, then press **PUSH JOG**.
 - Repeat 2 and 3 as necessary.
- 4- Press **CH SET**.

When Using A Satellite Tuner



Preparation

- 1- Connect the satellite tuner to the AV2 IN/DECODER connector on the rear of your recorder.
- 2- Set the AV2 SELECT switch to "AV2".

To Record Satellite Broadcasts...

- 1- Select the appropriate channel on the satellite tuner.
- 2- Press **NUMBER** key "0" to set your recorder's input mode to "AUX2".
- 3- Start recording (pg. 14, steps 3 - 6).

To Record Satellite Broadcasts Using ShowView Timer Recording...

- 1- Perform Guide Prog. Number setting.
 - In step 5 in the left column, press **NUMBER** key "0" to set "TV PROG" to "AUX2".
- 2- Perform ShowView Timer Recording (pg. 21).

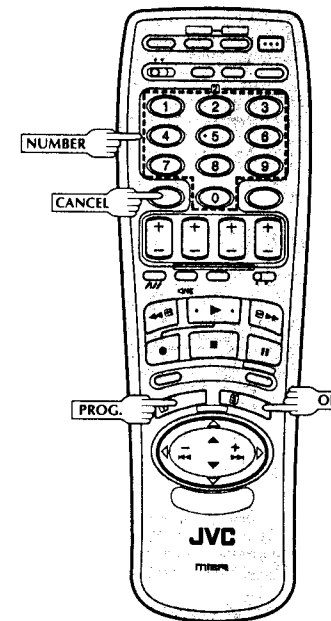
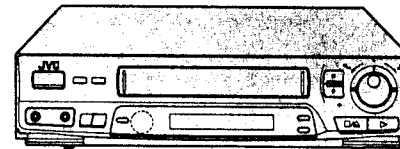
To Record Satellite Broadcasts Using Regular Timer Recording...

- 1- In step 6 on page 23, press **TV PROG. +/-** to set the channel position to "AUX2".

NOTES:

- During timer programming, once you have selected the programme you wish to record from the satellite tuner, set the system's timer. If your satellite tuner does not have a timer, leave it switched on.
- If your recorder's front panel VIDEO and/or AUDIO connectors are being used, they take priority and "AUX2" cannot be selected. Make sure no cables are connected to the front panel connectors when performing this procedure.

ShowView Timer Recording

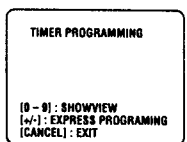


Before performing ShowView timer recording, be sure to read "Information On ShowView" (pg. 19).

ACCESS TIMER PROGRAMMING SCREEN

1

Press **PROG.**



The front display panel looks like this:



ENTER SHOWVIEW NUMBER

2

Press the **NUMBER** keys to enter the ShowView number of a programme you wish to record.

- If you make a mistake, press **CANCEL** and then input the correct number.

The ShowView number you enter appears on the front display panel:



ACCESS SHOWVIEW PROGRAM SCREEN

3

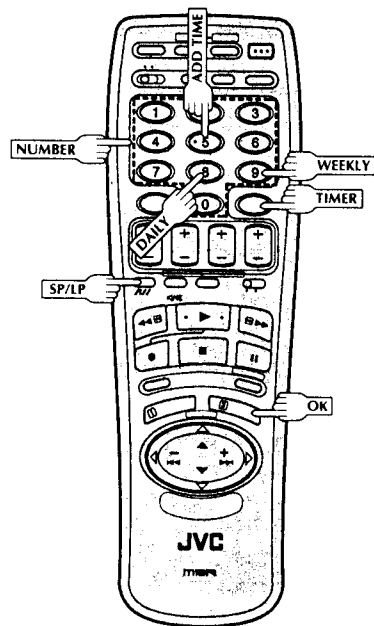
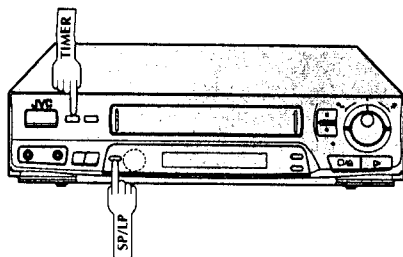
Press **OK**, and the ShowView Program screen appears (if you're just starting out, "P1" appears).

- If the number you entered is invalid, "ERROR" appears. Press **CANCEL** and input a valid ShowView number.

The front display panel looks like this:



- If you're not receiving PDC/VPS, press **NUMBER** key "7" to set "OFF" (pg. 24).



4 SET TAPE SPEED (J438E ONLY)

Press SP/LP to set the tape speed.

5 RETURN TO NORMAL SCREEN

Press OK.

- Repeat steps 1-5 for each additional programme.

6 ENGAGE RECORDER'S TIMER MODE

Press TIMER.

NOTE:

For safety, your recorder disables all other functions while in the Timer mode. If you want to use the recorder but its Timer mode is engaged, press **TIMER** and all other functions are operable. To re-engage the timer, press **TIMER**.

To Delay The Stop Time . . .

. . . press **ADD TIME** after pressing **OK** in step 3. Each time you press, the Stop time is delayed by 5 minutes (meaning that 5 minutes of recording time is added). You can easily compensate for anticipated programme schedule delays this way.

To Timer-Record Weekly Or Daily Serials . . .

. . . after pressing **OK** in step 3, press **WEEKLY** (NUMBER key "9") for weekly serials or **DAILY** (NUMBER key "8") for daily serials (Monday-Friday).

You can programme this recorder to timer-record as many as 8 programmes. If you try to programme the recorder to record a ninth, "PROGRAM FULL" appears on screen and "FULL" appears on the front display panel. To record the extra programme, you must first cancel any unnecessary programmes (see pg. 24).

Regular Timer Programming

If you don't know the SowView number for the programme you wish to record, use the following procedure to set your recorder to timer-record the programme. Remember, the clock must be set before you can programme the timer (see pg. 7).

1 ACCESS TIMER PROGRAMMING SCREEN

Press **PROG.**

2 ACCESS PROGRAMME SCREEN

Press **START +/-**. (If you're just starting out, "P1" appears.)

- P1 -			
START	STOP		
-:-:-	-:-:-		
SP	ON		
DATE	TV PROG		
25.12	--		
[+/-] → OK			

The front display panel looks like this:



3 ENTER PROGRAMME START TIME

Press **START +/-** to enter the time you want recording to start.

- Press and hold **START +/-** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.

The front display panel looks like this:



4 ENTER PROGRAMME STOP TIME

Press **STOP +/-** to enter the time you want recording to stop.

5 ENTER PROGRAMME DATE

Press **DATE +/-**. (The current date appears on screen. The date you enter appears in its place.)

6 ENTER CHANNEL POSITION

Press **TV PROG. +/-**.

- If you're not receiving PDC/VPS, press **NUMBER** key "7" to set to "OFF" (see pg. 24).

- P1 -			
START	STOP		
21:00	22:00		
SP	ON		
DATE	TV PROG		
25.12	1		
[+/-] → OK			



7 SET TAPE SPEED (J438E ONLY)

Press SP/LP to set the tape speed.

8 RETURN TO NORMAL SCREEN

After confirming all information is correct, press **OK** and the normal screen appears.

- Repeat steps 1-8 for each additional programme.

9 ENGAGE RECORDER'S TIMER MODE

Press **TIMER**.

To Timer-Record Weekly Or Daily Serials . . .

. . . anytime during steps 2 through 8, press **WEEKLY** (NUMBER key "9") for weekly serials or **DAILY** (NUMBER key "8") for daily serials (Monday-Friday).

NOTES:

- To timer-record from a satellite tuner connected to your recorder's AV2 IN/DECODER connector, press **TV PROG. +/-** in step 6 above to set the channel position to "AUX2".
- You can programme this recorder to timer-record as many as 8 programmes. If you try to programme the recorder to record a ninth, "PROGRAM FULL" appears on screen and "FULL" appears on the front display panel. To record the extra programme, you must first cancel any unnecessary programmes (see pg. 24).

Check And Cancel Programmes

ACCESS PROGRAMME SCREEN

1 Press **PROG CHECK**. Each time you press the next program's information appears.

- Press **OK** and watch the front display panel as the Start and Stop times, the Date and the Channel Position appear.
- If the recorder is turned on and the TV is set to its VIDEO mode, you can check program information on screen as well.

If All Information Is Correct . . .
... programming is completed.

If You Wish To Revise Data . . .
... with the recorder's power turned on, go to step 2.

If You Wish To Cancel A Program . . .
... with the recorder's power turned on, press **CANCEL**. All information you input is deleted.

REVISE PROGRAMME INFORMATION

2 Input the appropriate data using the **START +/-**, **STOP +/-**, **DATE +/-** and **TV PROG.** +/- buttons on the remote control.

Timer Warning

If you have programmed your recorder to timer-record a programme or a series of programmes, a warning appears on screen to tell you that the recording is to start in 5 minutes.



NOTES:

- The warning only appears if you're not in the Timer mode at that time.
- If this recorder is being used as the player for tape dubbing, the warning screen is recorded on the tape in the other video recorder.

The warning blinks for the entire 5 minutes leading up to the start of timer recording. To clear the display, press **CANCEL**.

Auto SP/LP Timer (J438E only)

If, when recording in SP mode, there is not enough tape to record the entire programme, the recorder automatically switches to LP mode to allow complete recording.

ENGAGE AUTO SP/LP TIMER

1 Press **AUTO SP/LP TIMER** on the recorder front panel. The button lights "green".

For Example . . .

Recording a program of 210 minutes in length onto a 180-minute tape

Approximately 150 minutes Approximately 60 minutes

SP mode	LP mode
Total 210 minutes	

Make sure you press **AUTO SP/LP TIMER** before performing timer programming.

NOTES:

- The Auto SP/LP Timer feature is not available during ITR (Instant Timer Recording), and the feature will not work properly with any tapes longer than E-180 as well as some tapes of shorter lengths.
- Even if, in step 1, you press **AUTO SP/LP TIMER** and it lights "green", that doesn't mean that the recorder will automatically change from SP to LP mode during the course of the recording. Watch the tape later to confirm.
- If you have programmed the recorder to timer-record 2 or more programs, the second programme and those thereafter may not fit on the tape if you engage the Auto SP/LP Timer mode. In this case, make sure the mode is not engaged, then set the tape speed manually during timer programming.
- There may be some noise at the point on the tape where the recorder switches from SP to LP mode.
- If you perform timer recording with both PDC/VPS and the Auto SP/LP Timer activated, and the programme goes beyond its originally scheduled length, there may be times when the programme cannot be recorded in its entirety.

PDC/VPS Recording

Now available from some TV stations, PDC (Programme Delivery Control) and VPS (Video Programme System) are services designed to assure safe, accurate timer recording. With this system, special code signals are transmitted together with the audio/video signals. These code signals control your video recorder and have precedence over advertised times you preset in the timer. This means that your recorder will start and stop recording when the preset TV programmes actually start and end — even if the broadcast time of a preset TV programme is changed.

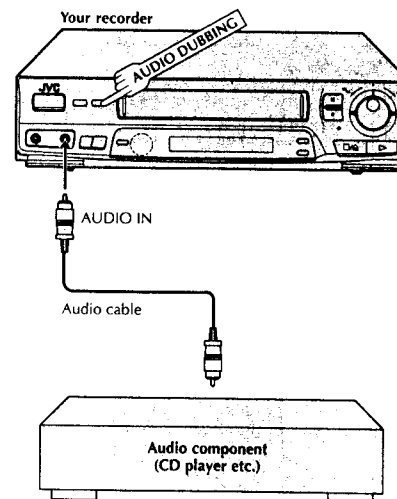
To Use PDC/VPS Service . . .

The default setting for PDC/VPS is "ON". To cancel PDC/VPS, press **NUMBER** key "7" so that "OFF" is displayed on screen during ShowView or regular timer programming.

NOTES:

- When you manually enter programmes (regular timer programming), set the start time (PDC or VPS time) exactly as advertised in the TV listing. A different time than advertised will result in no recording.
- PDC/VPS recording is also possible when a satellite tuner or a cable system is connected to AV1 IN on your recorder.
- When PDC/VPS recording is performed, the Instant ReView programme readout number may not match the actual number of programmes that have been timer-recorded (see pg. 11).

Audio Dubbing (J438E only)



Audio dubbing replaces the normal audio sound of a previously recorded tape with a new soundtrack.

CONNECT AUDIO SOURCE

1 Connect using the AUDIO IN connector on the recorder's front panel.

SET INPUT MODE

2 Press **NUMBER** key "0" to set the input mode. "F-AU" appears in the recorder's display panel instead of a channel position number.

START PLAYBACK

3 Press **PLAY**.

FIND START POINT FOR DUBBING

4 Watch the tape as it plays back, and when you reach the point where you want dubbing to start, press **PAUSE**.

ENGAGE AUDIO DUB MODE

5 Press **AUDIO DUBBING**.

START SOURCE PLAYBACK

6 Engage the audio source's Play mode.

START AUDIO RECORDING

7 Press **PLAY**, and audio dubbing begins.

- To stop dubbing temporarily, press **PAUSE**.

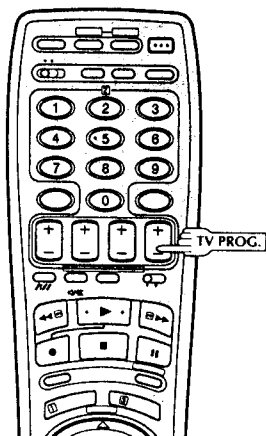
STOP AUDIO DUBBING

8 Press **STOP** to stop the recorder, and engage the audio source's Stop mode.

NOTES:

- Audio dubbing stops automatically when the counter reaches "0:00:00", and the recorder enters the Play mode. Check the counter reading before beginning audio dubbing.
- Audio dubbing is also possible with input via the rear panel AV1 or AV2. With AV2, set the **AV2 SELECT** switch to "AV2".
- Connections made to the front panel AUDIO and VIDEO IN connectors are given priority over the rear panel AV1 and AV2 input connectors.

Edit To Or From Another Video Recorder



You can use your video recorder as the source player or the recording deck.

1

MAKE CONNECTIONS

Connect the player's AUDIO/VIDEO OUT connector to the recorder's AUDIO/VIDEO IN connector.

When Using Your Video Recorder As The Source Player...

... connect its AV1 IN/OUT connector to the recording deck.

When Using Your Video Recorder As The Recording Deck...

... you can use the AV1 IN/OUT or AV2 IN connectors.

2

SET RECORDING DECK'S INPUT MODE

Set to AUX. With this video recorder, press TV PROG. to select depending on the connector being used — "AU 1" for the AV1 IN/OUT connector, or "AU 2" for the AV2 IN connector.

- When using the AV2 IN connector, make sure the AV2 SELECT switch is set to "AV2".

3

START SOURCE PLAYER

Engage its Play mode.

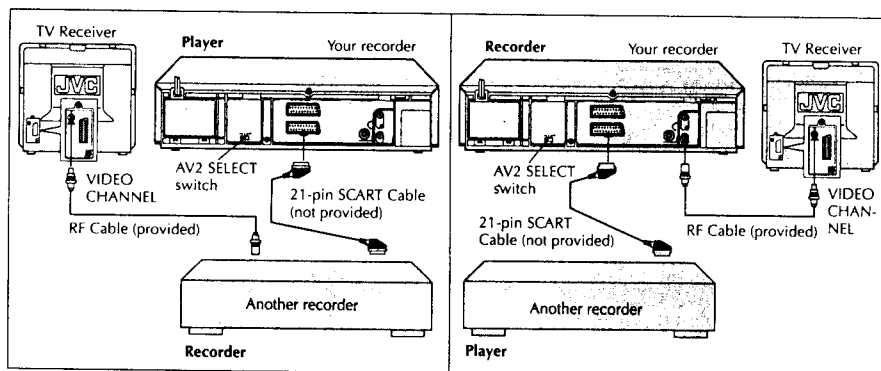
4

START RECORDING DECK

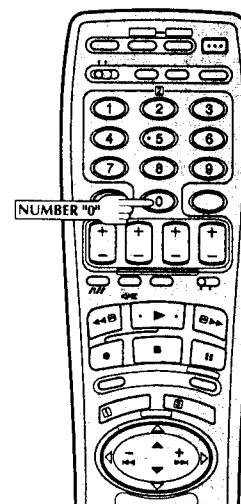
Engage its Record mode.

NOTE:

All necessary cables can be obtained from your dealer.



Edit From A Camcorder



You can use a camcorder as the source player and your video recorder as the recorder.

1

MAKE CONNECTIONS

To J438E Owners: Connect the camcorder's AUDIO/VIDEO OUT connectors to the recorder's front panel AUDIO/VIDEO input connectors.

- When a Master Edit Control-equipped JVC camcorder is used, the camcorder is capable of controlling the recorder. Refer to the camcorder's instruction manual for operating procedure.

To J238E Owners:

Connect the camcorder's AUDIO/VIDEO OUT connectors to the recorder's AV1 IN/OUT or AV2 IN connector.

2

SET RECORDER'S INPUT MODE

To J438E Owners: Press NUMBER key "0". "F-AU" appears in place of a channel number.

To J238E Owners:

Press NUMBER key "0" and/or TV PROG. to select depending on the connector being used — "AU 1" for the AV1 IN/OUT connector, or "AU 2" for the AV2 IN connector.

- When using the AV2 IN connector, make sure the AV2 SELECT switch is set to "AV2".

3

START CAMCORDER

Engage its Play mode.

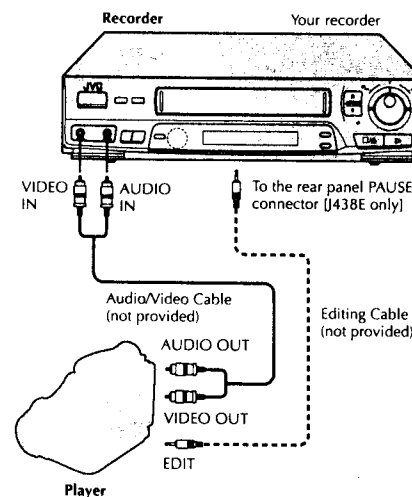
4

START RECORDER

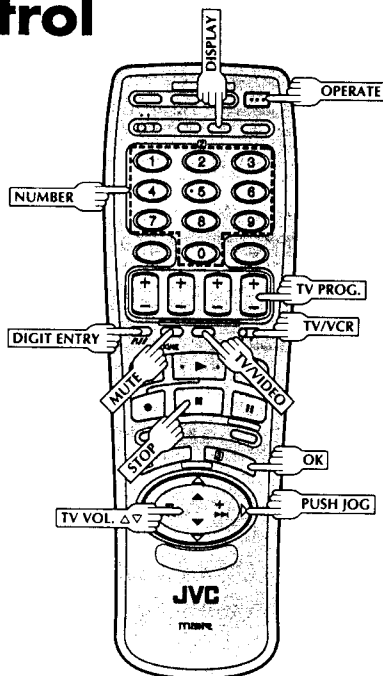
Engage its Record mode.

NOTE:

Connections made to the front panel AUDIO/VIDEO input connectors automatically override those made to the rear panel AUDIO/VIDEO input connectors. [J438E only]



Multi-Brand Remote Control



CODE	TV BRAND NAME
01	JVC
02	BRANDT, NORDMENDE, SABA, TELEAVIA, TELEFUNKEN, THOMSON
03	FERGUSON
04	PHILIPS
05	BLAUPUNKT, GRUNDIG
06	SONY
07	PANASONIC
08	GRAETZ, ITT, LUXOR, SALORA, SELECO
09	MIVAR
10	HITACHI
11	TOSHIBA
12	MITSUBISHI
13	FINLUX
14	NOKIA

Your remote control can operate the basic functions of your TV set. In addition to JVC TVs, other manufacturer's TVs can also be controlled by setting the appropriate switch on the remote control.

- Before you start . . .
- Turn on the TV using its remote control.
 - Set the remote control's TV/VCR switch to TV.

NOTE:

If your TV is a JVC, you don't have to set the code in step 1. Go to step 2.

1 SET TV BRAND CODE

Refer to the chart below. While holding down **OPERATE**, enter your TV's brand code using the **NUMBER** keys, then press **STOP**.

- You don't have to repeat this step until you replace your remote control's batteries.

2 TRY OPERATING TV

Press **OPERATE** on the remote to turn the TV off. If it goes off, try other operations.

- The **OPERATE** button, **TV/VIDEO** button, **TV PROG. +/-** button, **TV VOL. Δ▽** button and **MUTE** button on the remote can all be used to operate the TV.
- To return the remote to video recorder control, set its **TV/VCR** switch to VCR.

IMPORTANT

Although the provided remote control unit is compatible with JVC televisions, as well as many other models, it may not work with your TV or in some instances, may have limited function capability.

Control Your TV Using Additional Buttons

The **NUMBER** keys on the remote can also be used to select the TV's channel by setting the remote control to the TV mode.

- 1 Set the **TV/VCR** switch to TV.

- 2 Use the **NUMBER** keys, and the **DIGIT ENTRY** (**///**) button, the **PUSH JOG** button, the **DISPLAY** button or the **OK** button to select the TV's channel.

- With televisions under Code 01, 03, 04, 06, 07, 10 or 11, the **DIGIT ENTRY** button corresponds to the 1-digit/2-digit entry switching button (often labelled **-/-**) of your TV's remote control.

- With televisions under Code 01, 08 or 09, the **PUSH JOG Δ** button corresponds to the 10 + button, and the **PUSH JOG ▽** button corresponds to the 20 + button of your TV's remote control.

- With televisions using Code 09, the **DISPLAY** button corresponds to the 30 + button.

- With televisions using Code 06, the **OK** button corresponds to the **ENTER** button of your TV's remote control.

NOTE:

The way these buttons are used is determined by your TV. Use these buttons as instructed for your TV's remote control.

Storing Channels Manually

Store channels that were not stored during Auto Channel Set.

1 ACCESS CH. SET MODE MENU

Press and hold **CH SET** for more than 2 seconds. The Language screen appears. Press **OK**. The Ch. Set Mode menu appears.

2 SELECT MODE

Press **PUSH JOG Δ▽** to select "MANUAL CH SET", then press **OK**. The Confirmation screen appears.

3 SELECT POSITION

Press **PUSH JOG Δ▽** until an open position in which you want to store a channel begins blinking, then press **OK**. The Manual Ch. Set screen appears.

4 INPUT CHANNEL

The number "02" appears blinking beneath "CH". Press the **NUMBER** keys to input the channel number you want to store.

- Although "CH" is set to "02", when the Manual Ch. Set screen appears, to store channel 02, you must select "02" using the **NUMBER** keys.
- For fine tuning adjustment, press **PUSH JOG ▽** until the item beneath "CH" begins blinking, then press **PUSH JOG Δ▽**. While tuning, "F+" or "F-" appears.
- When storing a channel that sends scrambled broadcasts, press **PUSH JOG ▽** until "DECODER" blinks, then press **PUSH JOG Δ▽** to set "DECODER" to "ON" ("OFF" is the default setting).

5 ENTER NEW CHANNEL INFORMATION

Press **OK** or **STORE**, and the Confirmation screen appears.

- Repeat steps 3 through 5 as necessary.

6 CLOSE CONFIRMATION SCREEN

Press **CH SET**.

- To input the station name, see page 30.
- To change positions, see "Change Station Channel Position" (at right).

When Receiving A Scrambled Broadcast

Make sure that the **AV2 SELECT** switch is set to "DECODER" (pg. 4).

- 1- Perform steps 1 and 2 above.
- 2- Press **PUSH JOG Δ▽** to select the position of the channel broadcasting the scrambled programmes, then press **OK** three times.
- 3- Press **PUSH JOG ▽** until "DECODER" begins blinking, and set it to "ON" by pressing **PUSH JOG Δ▽**.
- 4- Press **OK** to access the Confirmation screen.
 - Repeat steps 2 - 4 for each additional channel.
- 5- Press **CH SET**.

Perform steps 1 and 2 of the previous procedure to access the Confirmation screen before continuing.

Delete A Channel

1 SELECT ITEM

Press **PUSH JOG Δ▽** until the item you want to delete begins blinking.

2 DELETE CHANNEL

Press **CANCEL**.

- The item directly beneath the cancelled one moves up one line.
- Repeat steps 1 and 2 as necessary.

3 CLOSE CONFIRMATION SCREEN

Press **CH SET**.

Change Station Channel Position

1 SELECT ITEM

Press **PUSH JOG Δ▽** until the item you want to move begins blinking. Then press **OK** and the station name (ID) and its channel (CH) number begin blinking.

2 SELECT NEW POSITION

Press **PUSH JOG Δ▽** to move the station to the new channel position, then press **OK**.

Example: If you moved the station in position 3 to position 7, the stations originally in positions 4-7 each move up one space.

- Repeat steps 1 and 2 as necessary.

3 CLOSE CONFIRMATION SCREEN

Press **CH SET**.

Perform steps 1 and 2 of "Storing Channels Manually" on page 29 to access the Confirmation screen before continuing.

Set Stations (A)

1 SELECT ITEM

Press **PUSH JOG** until the item you want begins blinking. Then press **OK** twice and the station's name (ID) begins blinking.

2 SELECT NEW STATION

Press **PUSH JOG** until the new station's name (ID) you want to store begins blinking. Registered station names (pg. 31) appear as you press **PUSH JOG**.

3 SWITCH STATIONS

Press **OK**.

- Repeat steps 1 through 3 as necessary.

4 CLOSE CONFIRMATION SCREEN

Press **CH SET**.

Set Stations (B)

NOTE:

First perform step 1 of the above procedure.

2 SELECT STATION NAME CHARACTER

Press **PUSH JOG** and the first letter of the station name begins blinking.

3 ENTER NEW CHARACTER

Press **PUSH JOG** to cycle through the characters (A-Z, 0-9, -, *, +, — (space)) and stop when the desired one is indicated, then press **PUSH JOG** to enter. Enter the remaining characters the same way (maximum of 4).

After entering all characters, press **OK**.

- Repeat steps 1 through 3 as necessary.

- If you make a mistake, press **PUSH JOG** until the incorrect character begins blinking. Then enter the correct character by pressing **PUSH JOG**.

4 CLOSE CONFIRMATION SCREEN

Press **CH SET**.

Fine-Tuning Channels Already Stored

1 SELECT CHANNEL TO FINE-TUNE

Press **PUSH JOG** until the channel you want to tune begins blinking.

2 ACCESS MANUAL CH. SET SCREEN

Press **OK** three times. The Manual Ch. Set screen appears.

3 PERFORM TUNING

Press **PUSH JOG** until the picture is its clearest. Then press **OK**.

- The Confirmation screen appears.

- Repeat steps 1 through 3 as necessary.

4 CLOSE CONFIRMATION SCREEN

Press **CH SET**.

ID*	STATION NAME
1000	TV1000
3SAT	3SAT
ADLT	ADULT
ANT3	ANTENA3
ARD	ARD
ARTE	ARTE
BBC	BBC GROUP
BBC1	BBC1
BBC2	BBC2
BR3	BAYERN3
C+	CANAL PLUS
C1	PORTUGUESES
CAN5	CANALE5
CH4	CHANNEL4
CH5	CHANNEL5
CHILD	CHILD
CINE	CINEMA
CLUB	TELECLUB
CMT	CMT
CNN	CNN
CSUR	ANDALUCIA
DISC	DISCOVERY
DR	DR TV
DRS	DRS
DSF	DSF
ETB1	ETB1
ETB2	ETB2
EURO	EURONEWS
EUSP	EUROSPORTS
FEMM	FEMMAN
FILM	FILM
FNET	FILMNET
FR2	France2
FR3	France3
GALA	GALAVISION
HR3	HESSEN3
INFO	INFO-KANAL
ITA1	ITALIA1
ITA7	ITALIA7
ITV	ITV
JSTV	JSTV
KA2	KA2
KAB1	KABEL1
KAN2	KANAL2
LOCA	LOCAL
M6	M6
MBR	MBR
MCM	MCM
MDR	MDR
MOVE	MOVIE
MTV	MTV
MTV3	MTV3
N3	NORD3
N-TV	N-TV
NBC	NBC SUPER
NDR	NDR
NED1	NED1
NED2	NED2
NED3	NED3
NEWS	NEWS
NRK	NRK
ODE	ODEON
ORF1	ORF1

ID*	STATION NAME
ORF2	ORF2
ORF3	ORF3
OWL3	OWL3
PREM	PREMIERE
PRO7	PRO7
RAI1	RAI1
RAI2	RAI2
RAI3	RAI3
RET4	RETE4
21	TELE21
RTBF	RTBF1 or 2
RTL	RTL
RTL2	RTL2
RTL4	RTL4
RTP	RTP
S4	SCHWEIZ4
SAT1	SAT1
SBS	SBS
SHOW	SHOW
SIC	SOCIETADE
SKY	SKY CHANNEL
SKYN	SKY NEWS
SPRT	SPORT
SRTL	SUPER RTL
STAR	STAR-TV
SVT1	SVT1
SVT2	SVT2
SW3	SUEDWEST3
TCC	TCC
TELE	TELE
TELS	TELES
TF1	TF1
TM3	TM3
TMC	TELEMONTECARLO
TNT	TNT INT
TRT	TRT INT
TSI	TSI
TSR	TSR
TV1	BRTN TV1
TV2	BRTN TV2
TV3	TV3
TVE1	TVE1
TVE2	TVE2
TVG	TV GALICIA
TVI	TV INDEPENDENT
TVN	TV NORGE
VCR	VIDEO
VERO	VERONICA
VH-1	VH-1
VIVA	VIVA
VIV2	VIVA2
VMTV	VIDEO MUSIC
VOX	VOX
VT4	VT4
VTM	VTM
WDR1	West1
WDR3	West3
YLE1	YLE1
YLE2	YLE2
ZDF	ZDF
ZTV	ZTV

* The ID designator appears on your recorder's front display panel and in the on-screen listing.

Before requesting service for a problem, use this chart and see if you can repair the trouble yourself. Small problems are often easily corrected, and this can save you the trouble of sending your video recorder off for repair.

POWER

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. No power is applied to the recorder.	• The mains power cord is disconnected.	Connect the mains power cord.
2. The clock is functioning properly, but the recorder cannot be powered.	• "⊙" is displayed on the display panel.	Press the TIMER button to turn the "⊙" indicator off.

TAPE TRANSPORT

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The tape does not run during recording.	• "00" is displayed on the display panel.	Press PLAY to turn the "00" indicator off.
2. The tape stops during rewind or fast-forward.	• "M" is displayed on the display panel.	Press C.MEMORY to deactivate the Counter Memory function and turn the "M" indicator off.
3. The tape will not rewind or fast-forward.	• The tape is already fully rewound or fast-forwarded.	Check the cassette.

PLAYBACK

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The playback picture does not appear while the tape is running.	• If you're using the RF OUT connection, the TV receiver's channel selector is set to the wrong video channel. • If you're using the AV connection, the TV receiver is not set to the AV mode.	If you are using the RF OUT connection, set the TV receiver to the RF converter channel (UHF 36). (☞ pg. 3) If you are using the AV connection, set the TV to its AV mode.
2. Noise appears during visual search.	• This is normal.	
3. Noise appears during normal playback.	• The automatic tracking mode is engaged.	Try manual tracking. (☞ pg. 11)
4. Noise appears during slow-motion playback.	• The automatic tracking mode is engaged.	Try manual tracking. (☞ pg. 11)
5. Noise appears during still playback.		Press PAUSE a few times to remove the noise bars from the screen.
6. The playback picture is blurred or interrupted while TV broadcasts are clear.	• The video heads may be dirty.	Consult your JVC dealer.

RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Recording cannot be started.	• There is no cassette loaded, or the cassette loaded has had its Record Safety tab removed.	Insert a cassette, or using adhesive tape, reseal the slot where the tab was removed.
2. TV broadcasts cannot be recorded.	• "AU" has been selected as the input mode.	Set to the desired channel.

3. Tape-to-tape editing is not possible.	• The source (another video recorder, camcorder) has not been properly connected. • All necessary power switches have not been turned on. • The input mode is not correct.	Confirm that the source is properly connected. Confirm that all units' power switches are turned on. Set the input mode to "AU".
4. Camcorder recording is not possible.	• The camcorder has not been properly connected. • The input mode is not correct.	Confirm that the camcorder is properly connected. Set the input mode to "AU".

TIMER RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Timer recording won't work.	• The clock and/or the timer have been set incorrectly. • The timer is not engaged.	Re-perform the clock and/or timer settings. Press TIMER and confirm that "⊙" is displayed on the display panel.
2. On-screen timer programming is not possible.	• Timer recording is in progress.	Timer programming can't be performed while a timer recording is in progress. Wait until it finishes.
3. "⊙" and "⊞" on the display panel won't stop blinking.	• The timer is engaged but there's no cassette loaded.	Load a cassette with the Record Safety tab intact, or cover the hole using adhesive tape.
4. The cassette is automatically ejected, and "⊙" and "⊞" on the display panel won't stop blinking.	• The loaded cassette has had its Record Safety tab removed.	Remove the cassette and cover the hole with adhesive tape, or insert a cassette with the Record Safety tab intact.
5. "⊙" blinks for 10 seconds and the Timer mode is disengaged.	• TIMER has been pressed when there are no programs in memory, or the timer record information has been programmed incorrectly.	Check the programmed data and re-program as necessary, then press TIMER again.
6. The cassette is automatically ejected, the power shuts off and "⊙" and "⊞" won't stop blinking.	• The end of the tape was reached during timer recording.	The programme may not have been recorded in its entirety. Next time make sure you have enough time on the tape to record the entire programme.
7. ShowView does not timer-record properly.	• The recorder's channel positions have been set incorrectly.	Refer to "Guide Prog. Number Set" and re-perform the procedure (☞ pg. 19).

OTHER PROBLEMS

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Whistling or howling is heard from the TV during camcorder recording.	• The camcorder's microphone is too close to the TV. • The TV's volume is too high.	Position the camcorder so its microphone is away from the TV. Turn the TV's volume down.
2. When scanning channels, some of them are skipped over.	• Those channels have been designated to be skipped.	If you need the skipped channels, restore them (☞ pg. 29).
3. The channel cannot be changed.	• Recording is in progress.	Press PAUSE to pause the recording, change channels, then press PLAY to resume recording.
4. The remote control won't operate the TV.	• The TV/VCR switch is in the wrong position.	Set the switch to TV.

PLAYBACK

- Q. What happens if the end of the tape is reached during playback or search?**
A. The tape is automatically rewound to the beginning.
- Q. Can the video recorder indefinitely remain in the still mode?**
A. No. It stops automatically after 5 minutes to protect the heads.
- Q. During search, slow, still and frame-by-frame playback, I can't hear any audio. What's the problem?**
A. This is normal.
- Q. When returning from multi-speed search to normal playback, the picture is disturbed. Should I be concerned about this?**
A. No, it is normal.
- Q. Noise bars appear during multi-speed search. What's the problem?**
A. This is normal.
- Q. Other than preventing further recording, what effect does removing the Record Safety tab have?**
A. It disables marking of index codes.
- Q. Sometimes, during Index Search, the video recorder can't find the programme I want to see. Why not?**
A. There may be index codes too close together.

RECORDING

- Q. When I pause and then resume a recording, the end of the recording before the pause is overlapped by the beginning of the continuation of recording. Why does this happen?**
A. This is normal. It reduces distortion at the pause and resume points.
- Q. Can the video recorder indefinitely remain in the Record-Pause mode?**
A. No. The video recorder goes to its Stop mode automatically after 5 minutes to protect the heads.
- Q. What happens if the tape runs out during recording?**
A. The video recorder automatically rewinds it to the beginning.

TIMER RECORDING

- Q. "O" and "P" remain lit on the display panel. Is there a problem?**
A. No. This is a normal condition for a timer recording in progress.
- Q. Can I program the timer while I'm watching a tape or a TV broadcast?**
A. You won't see the picture as it is replaced by the on-screen menu, but the audio from the program or tape you're viewing can be heard.

ATTENTION:

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the recorder off and unplug the mains power cord. Then plug it in again and turn the recorder on. Take out the cassette. After checking the cassette, operate the unit as usual.

SPECIFICATIONS

GENERAL

Power requirement	: AC 220 – 240 V~, 50/60 Hz
Power consumption	: 20 W
Temperature	
Operating	: 5°C to 40°C
Storage	: –20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 340 mm
Weight	: 4.3 kg
Format	: VHS PAL standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette
(LP) [J438E only]	: 480 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines/50 fields
Recording system	: DA4 (Double Azimuth) head helical scan system (HR-J438E) Rotary two-head helical scan system (HR-J238E)
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz
Input/Output	: 21-pin scart connector x 2 (IN/OUT x 1, IN/DECODER x 1) RCA connector x 1 (IN x 1) [J438E only]

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position "AU")
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF 47 – 89/104 – 300/ 302 – 470MHz UHF 470 – 862MHz
Aerial output	: UHF channel 36 (Adjustable 32 – 40)
Memory backup time	: Approx. 60 min.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6" battery x 2
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*Specifications shown are for SP mode unless otherwise specified.
 E. & O.E. Design and specifications subject to change without notice.*

List Of Terms

This guide serves as a quick way to locate frequently used terms and on-screen display names. The first page on which the term appears is listed. Most terms appear more than once in the instruction manual.

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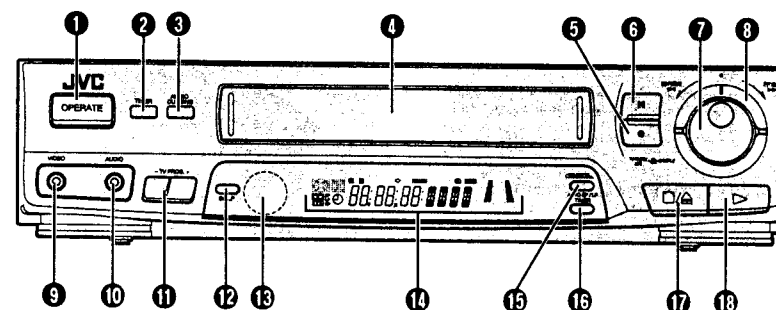
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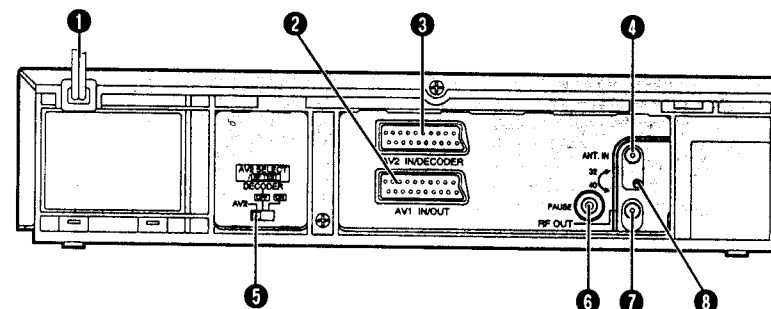
FRONT VIEW



*Remove the cap to use the front panel connectors.

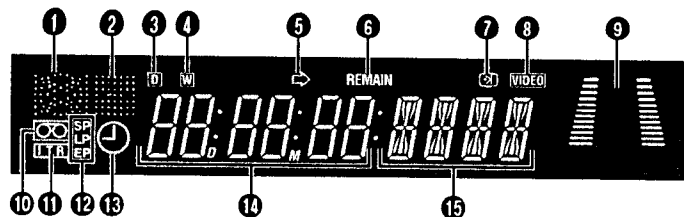
- | | |
|--|---|
| <p>1 OPERATE Button (pg. 5)</p> <p>2 TIMER Button (pg. 22)</p> <p>3 AUDIO DUBBING Button [J438E] (pg. 25)</p> <p>4 Cassette Loading Slot</p> <p>5 RECORD Button (pg. 14)</p> <p>6 PAUSE Button (pg. 10)</p> <p>7 TV PROG. Dial (pg. 14)</p> <p>8 JOG Dial [J438E only] (pg. 10)</p> <p>9 SHUTTLE Ring (pg. 10)</p> <p>10 VIDEO Input Connector [J438E only] (pg. 27)</p> | <p>11 AUDIO Input Connector [J438E only] (pg. 25)</p> <p>12 TV PROG. +/- Buttons (pg. 5)</p> <p>13 SP/LP [Tape Speed] Button [J438E only] (pg. 14)</p> <p>14 Infrared Beam Receiving Window</p> <p>15 Display Panel (pg. 38)</p> <p>16 REVIEW Button (pg. 11)</p> <p>17 AUTO SP/LP TIMER Button [J438E only] (pg. 24)</p> <p>18 STOP/EJECT Button (pg. 9)</p> <p>19 PLAY Button (pg. 9)</p> |
|--|---|

REAR VIEW



- | | |
|---|---|
| <p>1 Mains Power Cord (pg. 3)</p> <p>2 AV1 IN/OUT Connector (pg. 3)</p> <p>3 AV2 IN/DECODER Connector (pg. 4)</p> <p>4 ANT. IN Connector (pg. 3)</p> <p>5 AV2 SELECT/RF TEST Switch (pg. 4)</p> | <p>6 Remote PAUSE Connector [J438E only] (pg. 27)</p> <p>7 RF OUT Connector (pg. 3)</p> <p>8 RF Output Channel Adjustment Screw (pg. 4)</p> |
|---|---|

DISPLAY PANEL



1 and 2 Symbolic Mode Indicators

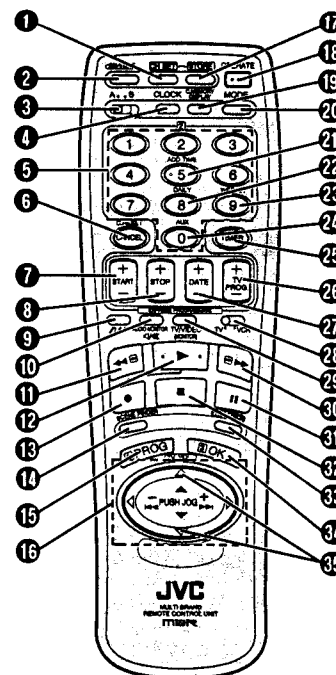
PLAY:		STILL: FORWARD SLOW:	
FF:		STILL: REVERSE SLOW:	
REW:		RECORD:	
FF VARIABLE SHUTTLE SEARCH:		RECORD PAUSE:	
REW VARIABLE SHUTTLE SEARCH:		AUDIO DUBBING: **	
REVERSE PLAY:		AUDIO DUBBING PAUSE: **	

* The indicator will blink during turbo search.

** J438E only

- 3 "DAILY" Program Mark (pg. 22)
- 4 "WEEKLY" Program Mark (pg. 22)
- 5 Start Time/Stop Time Indicator (pg. 21)
- 6 Tape Remaining Time Indicator (pg. 13)
- 7 PDC/VPS Indicator (pg. 24)
- 8 VIDEO Indicator (pg. 5)
- 9 B.E.S.T. Picture System Display (pg. 15)
- 10 "Cassette Loaded" Mark
- 11 Instant Timer Recording (pg. 18)
- 12 Tape Speed Indicators (J438E only) (pg. 14)
- 13 "Timer" Indicator (pg. 22)
- 14 Clock/Counter/Tape Remaining Time Display (pg. 7)
- 15 Channel/Mode Display (pg. 5)

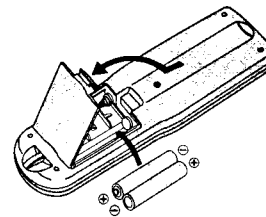
REMOTE CONTROL



- 1 CH SET Button (pg. 5)
- 2 REVIEW Button (pg. 11)
- 3 A/B CODE Switch (pg. 13)
- 4 CLOCK Button (pg. 7)
- 5 NUMBER Keys (pg. 14)
- 6 CANCEL Button (pg. 20)
- 7 C.RESET Button (pg. 13)
- 8 START +/- Button (pg. 23)
- 9 STOP +/- Button (pg. 23)
- 10 SP/LP Button (pg. 11)
- 11 DIGIT ENTRY Button (pg. 28)
- 12 TV MUTE Button (pg. 28)
- 13 Rewind [REW] Button (pg. 9)
- 14 PLAY Button (pg. 9)
- 15 RECORD Button (pg. 14)
- 16 SCENE FINDER Button (pg. 12)
- 17 PROG Button (pg. 21)
- 18 PUSH JOG $\Delta \nabla \triangleleft \triangleright$ Button (pg. 5)
- 19 PUSH JOG $\triangleleft \triangleright$ Button (pg. 10)
- 20 STORE Button (pg. 29)
- 21 C.MEMORY Button (pg. 13)
- 22 OPERATE Button (pg. 5)
- 23 DISPLAY Button (pg. 13)
- 24 MODE Button (pg. 15)
- 25 ADD TIME Button (pg. 22)
- 26 DAILY Button (pg. 22)
- 27 WEEKLY Button (pg. 22)
- 28 AUX Button (pg. 25)
- 29 TIMER Button (pg. 22)
- 30 TV PROG. +/- Button (pg. 5)
- 31 DATE +/- Button (pg. 23)
- 32 TV/VCR Switch (pg. 28)
- 33 TV/VIDEO Button (pg. 5)
- 34 Fast Forward [FF] Button (pg. 9)
- 35 PAUSE Button (pg. 10)
- 36 STOP Button (pg. 9)
- 37 PROG CHECK Button (pg. 24)
- 38 OK Button (pg. 5)
- 39 TV VOL $\Delta \nabla$ Button (pg. 28)

Installing Batteries

- 1 Open the battery compartment cover.
- 2 Insert 2 "R6"-size batteries (provided) in the correct directions.
- 3 Replace the cover.



How To Use

The remote control can operate most of your video recorder's functions, as well as basic functions of TV sets of JVC and other brands (pg. 28).

- Point the remote control toward the sensor window.
- The maximum operating distance of the remote control is about 8 m.

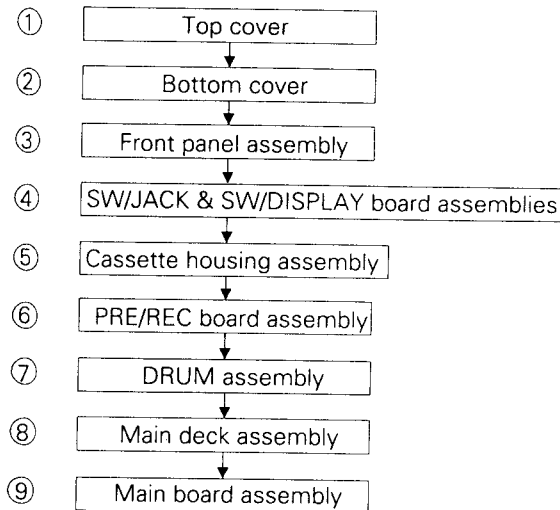
NOTE:

If for some reason the remote control doesn't work properly, remove its batteries, wait a short time and then try again.

SECTION 1 DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART

This flowchart lists shows the disassembly steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend,route and dress the flat cables as they were originally.



1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	4(S1)	
②	BOTTOM COVER	D2	(S2), 7(L1)	
③	FRONT PANEL ASSEMBLY	D3	7(L2), *JOG/SHUTTLE	<NOTE 1>
④	SW/JACK & SW/DISPLAY BOARD ASSEMBLIES	D4	12(L3), *CN1,	<NOTE 2>
⑤	CASSETTE HOUSING ASSEMBLY	D5	4(S3) EARTH PLATE	<NOTE 3>
⑥	PRE/REC BOARD ASSEMBLY	D6	2(S4), *CN1 *CN201, *CN202 SHIELD CASE	

- (1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.
- (2) Part name to be removed or installed.
- (3) Fig.No. showing procedure or part location
- (4) Identification of part to be removed, unhooked, unlocked, released, unplugged, unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, * = Unhook, unlock, release, unplug or unsolder.
- (5) Adjustment information for installation

1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	5(S1)	
②	BOTTOM COVER	D2	(S2), 7(L1)	
③	FRONT PANEL ASSEMBLY	D3	7(L2), *JOG/SHUTTLE	<NOTE1>
④	SW/JACK & SW/DISPLAY BOARD ASSEMBLIES	D4	12(L3), *CN1201	<NOTE2>
⑤	CASSETTE HOUSING ASSEMBLY	D5	2(S3), 2(S4)	<NOTE3>
⑥	PRE/REC BOARD ASSEMBLY	D6	2(S5), *CN101 *CN1, SHIELD CASE	<NOTE4>
⑦	DRUM ASSEMBLY	D7	3(S6), WR1,	<NOTE5>
⑧	MAIN DECK ASSEMBLY	D8	2(S7), WR2 WR3, 2(L4), *CN703	<NOTE6>
⑨	MAIN BOARD ASSEMBLY	D9	2(S8)	

<NOTE1>

When reattaching the front panel assembly, make sure that the door opener (a) of the cassette housing assembly is lowered in position prior to the reinstallation.

<NOTE2>

When plugging the connector in, check that the flat wire is inserted properly and fully.

<NOTE3>

When reattaching the cassette housing assembly, pay careful attention to the switch lever not to make it touch the REC switch knob of the REC SAFETY board assembly from the upside.

(If the REC switch knob of the REC SAFETY board assembly is damaged, cassette loading is impossible.)

<NOTE4>

When removing the PRE/REC board assembly, unhook the two spacers connecting it with the Main board assembly with pliers from the top side then remove the PRE/REC board assembly.

<NOTE5>

When plugging the connector in, check that the flat wire is inserted properly and fully.

<NOTE6>

- When removing the Main deck assembly only, unhook the two spacers connecting it with the Main board assembly with pliers from the back side of the Main board assembly first, and then remove the Main deck assembly.
- When reattaching the Main deck assembly to the Main board assembly, make sure to set the spacers in to the retaining slots respectively.

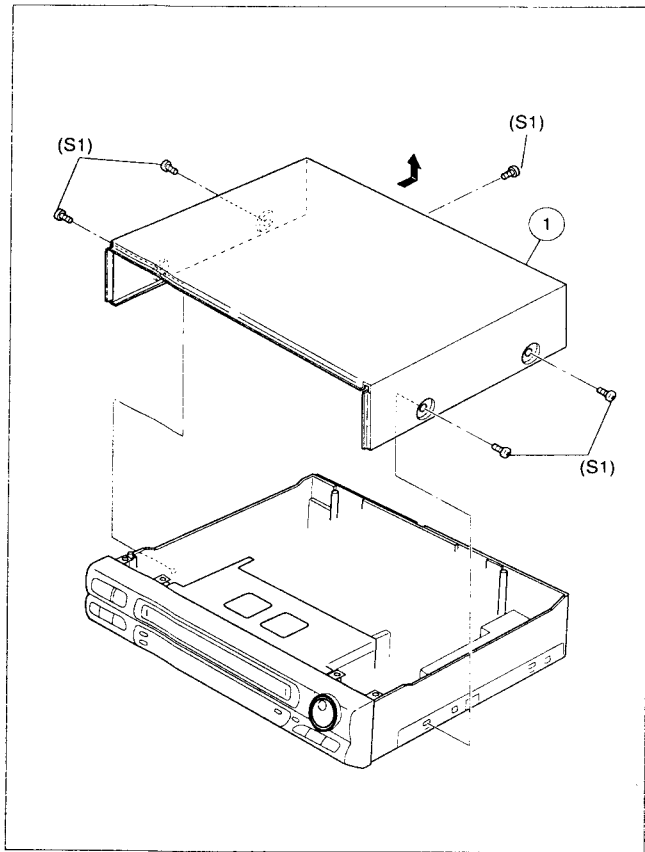


Fig. D1

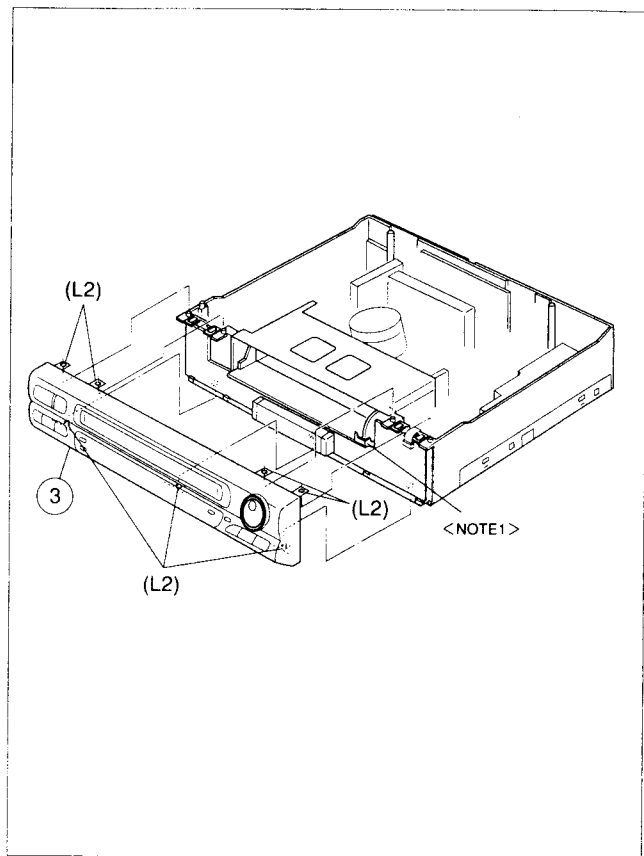


Fig. D3

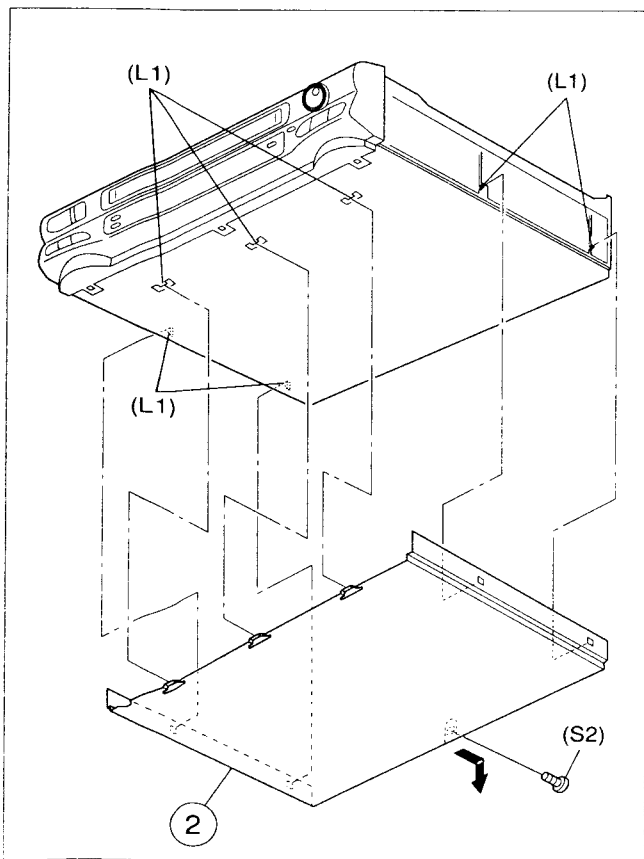


Fig. D2

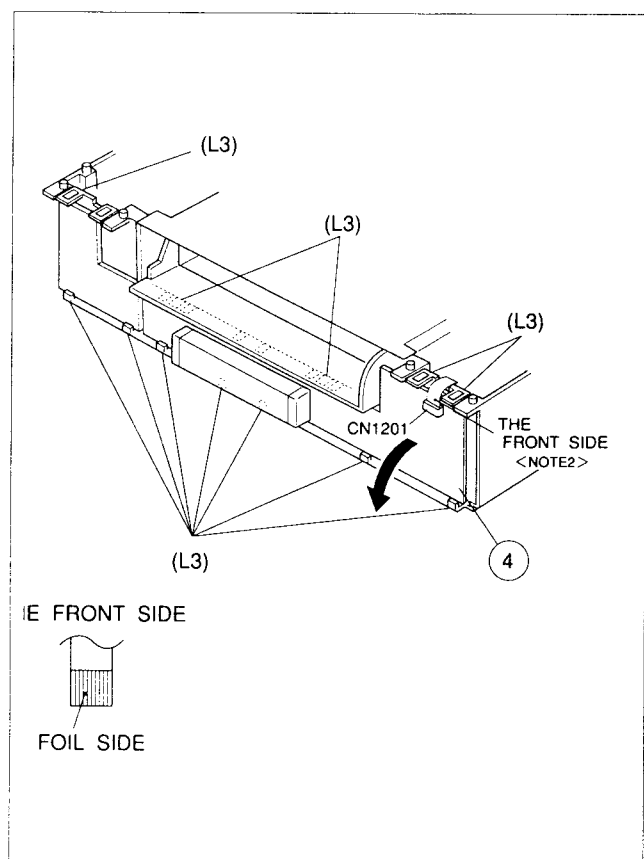


Fig. D4

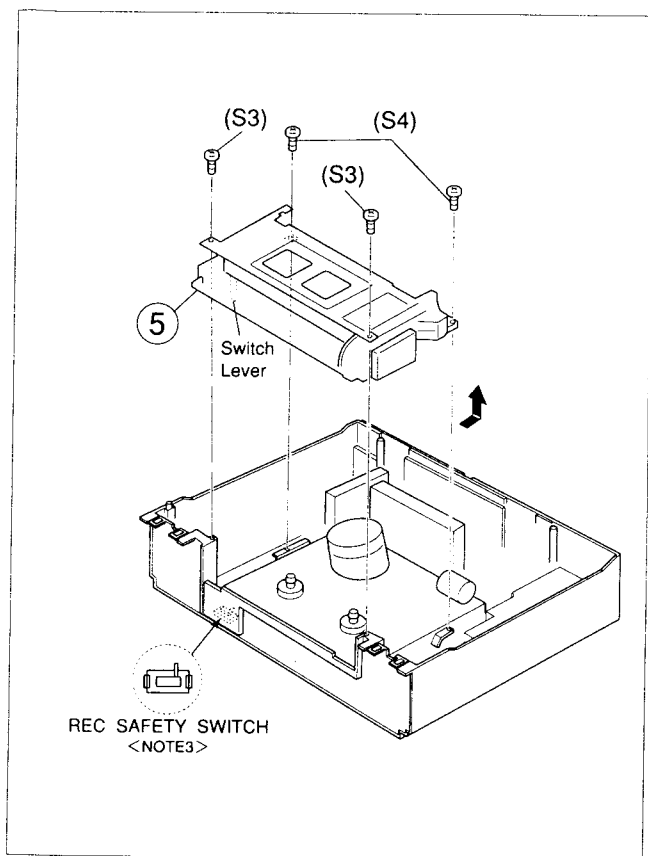


Fig. D5

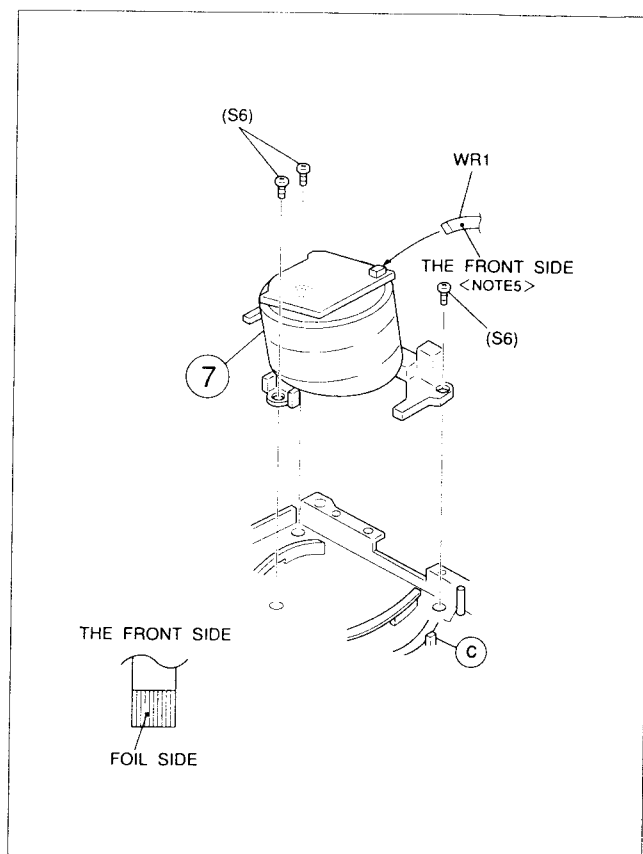


Fig. D7

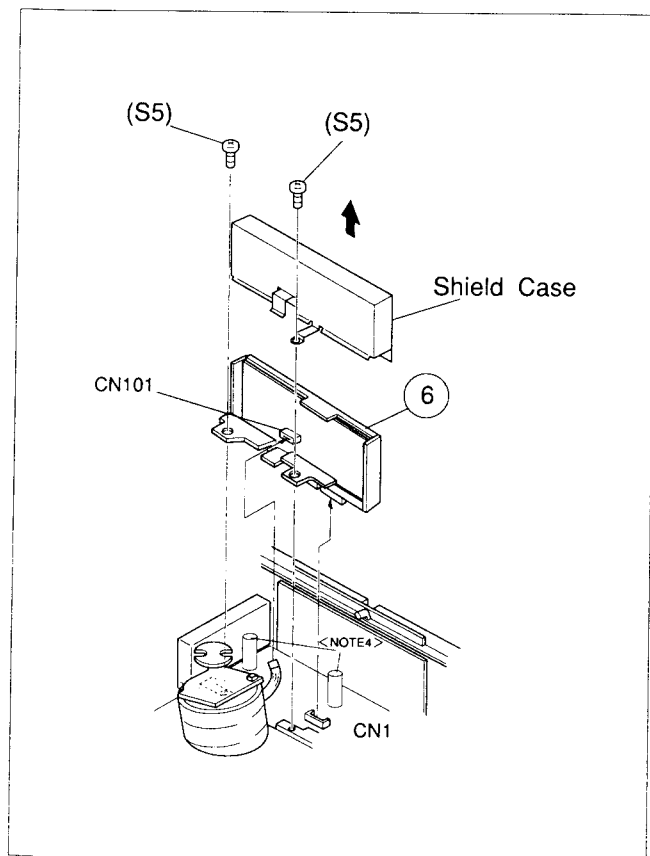


Fig. D6

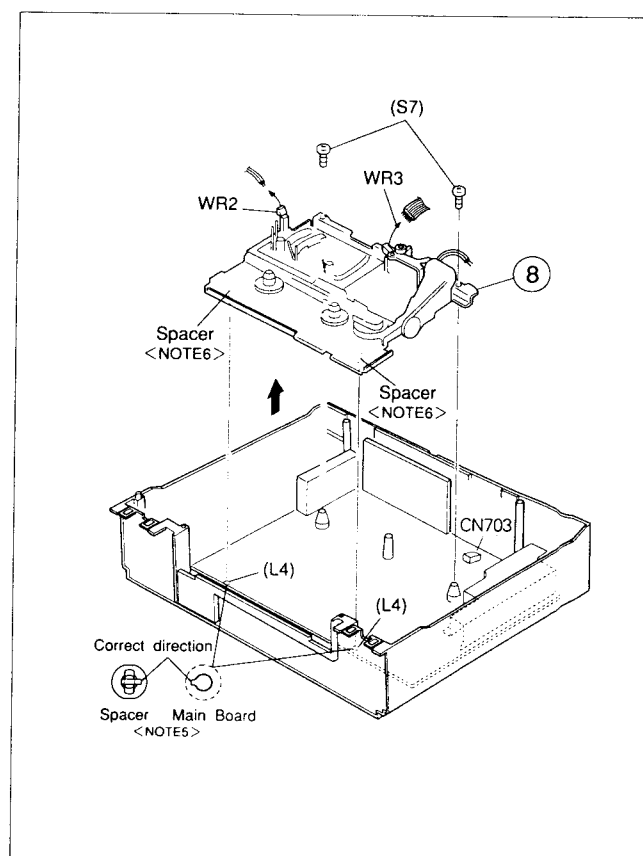


Fig. D8

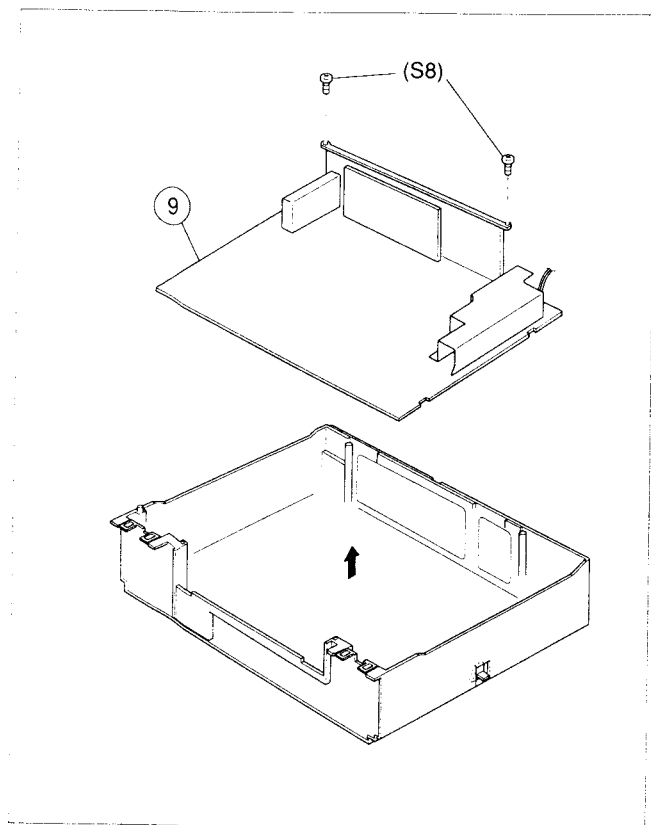


Fig. D9

1.4 CASSETTE HOUSING INSTALLATION

NOTE: Observe the mechanical phase and position (see figure) when installing the cassette housing assembly. If these are incorrect, the system will not operate properly even when tape is inserted.

1. Check that the hole of the control cam are aligned to the deck hole. If necessary, turn the mode motor belt by hand to adjust the position.

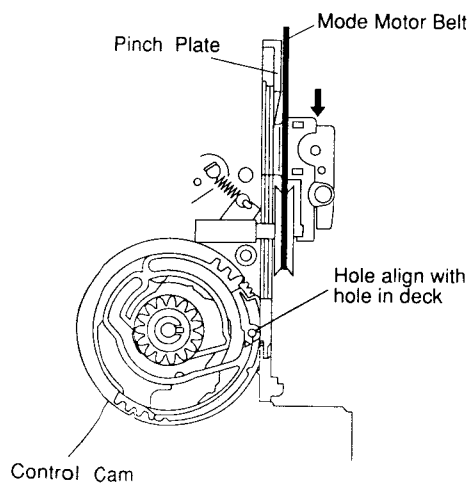


Fig. 1-4-1

1.5 SERVICE POSITION

1.5.1 How to take out the Mechanism and Main board assemblies.

- (1) Remove the Top cover, Front panel assembly, and CN1201 and SW/DISPLAY board assembly.
- (2) Take out 4 screws (A), 2 screws (B) and 1 screw (C) as shown in Fig. 1-5-1.

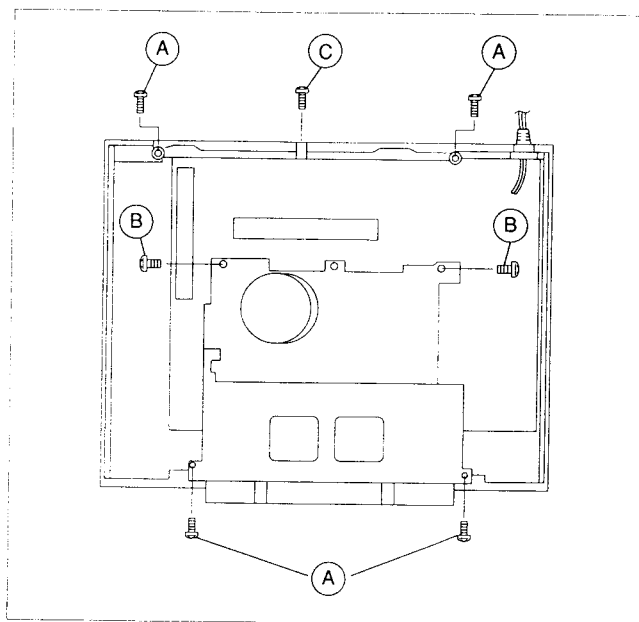


Fig. 1-5-1

- (3) Remove the Mechanism assembly (including Cassette housing) and Main board assembly out of the chassis as shown in Fig. 1-5-2.

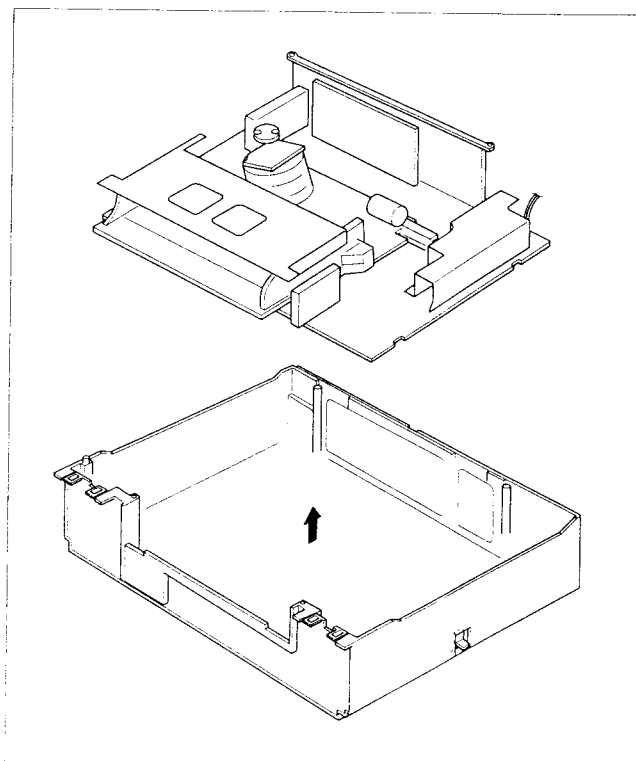


Fig. 1-5-2

- (5) Turn over the Mechanism assembly and Main board assembly then connect CN1201 of the SW/DISPLAY board assembly.
- (6) Carry out checks & repairs as necessary as shown in Fig.1-5-3.

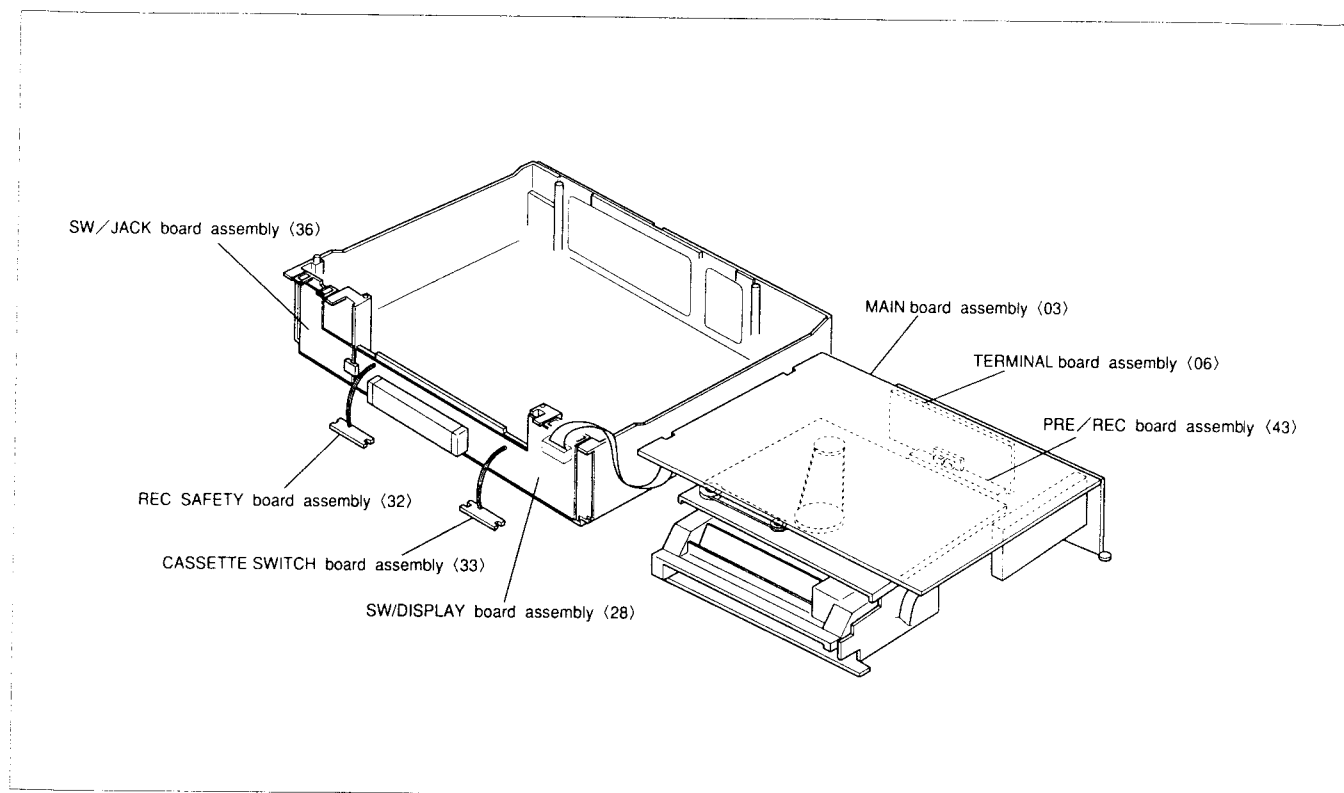


Fig. 1-5-3

1.5.2 Cautions on cassette loading when mechanism is in service position

The REC SAFETY board assembly of this set serves both for detecting the safety tab (erasure prevention tab) of a cassette and detecting a cassette loaded. Therefore, cassette loading in the condition that the mechanism is disassembled from the set needs manual operation of the switches of the REC SAFETY board assembly and the CASSETTE SWITCH board assembly.

1.5.3 Cassette loading and ejecting procedures when mechanism is in service position

- (1) Insert a cassette tape halfway into the cassette housing assembly.
- (2) Press the switch of the REC SAFETY board assembly to turn on.
- (3) When the cassette loading begins and the cassette goes down to the bottom, immediately press the switch of the REC SAFETY board assembly to turn off and hold the status that the switch of the CASSETTE SWITCH board assembly is turned on. (Fix the switch with adhesive tape or put a screwdriver, etc. on it to leave the switch in the ON status.)

- (4) In this status, desired operations (recording, playback, fast forward, rewind, etc.) can be performed.

Note: When the mechanism is in the service position, the safety tab of cassette tape is not detected and recording on cassette tapes without safety tab is possible. Therefore, carefully choose a cassette tape for operation in this mode so as to avoid using cassette tapes of important recording.

- (5) For ejecting the cassette in this status, do it in the reverse order of cassette loading mentioned above.

Note: If the manual operation REC SAFETY switch timing is incorrect, the cassette may be completely or partially ejected, and the cassette is often ejected incompletely. In such a case, it is possible to take out the cassette by hand.

If it is desired to load a cassette again after the cassette is ejected in the above procedure, make sure to set the tray of the cassette housing assembly in the frontmost position prior to loading the cassette once again.

1.5.4 Opening on the chassis.

The chassis assembly has openings for easy access to the checkpoints and connector pins as shown in Fig.1-5-4.

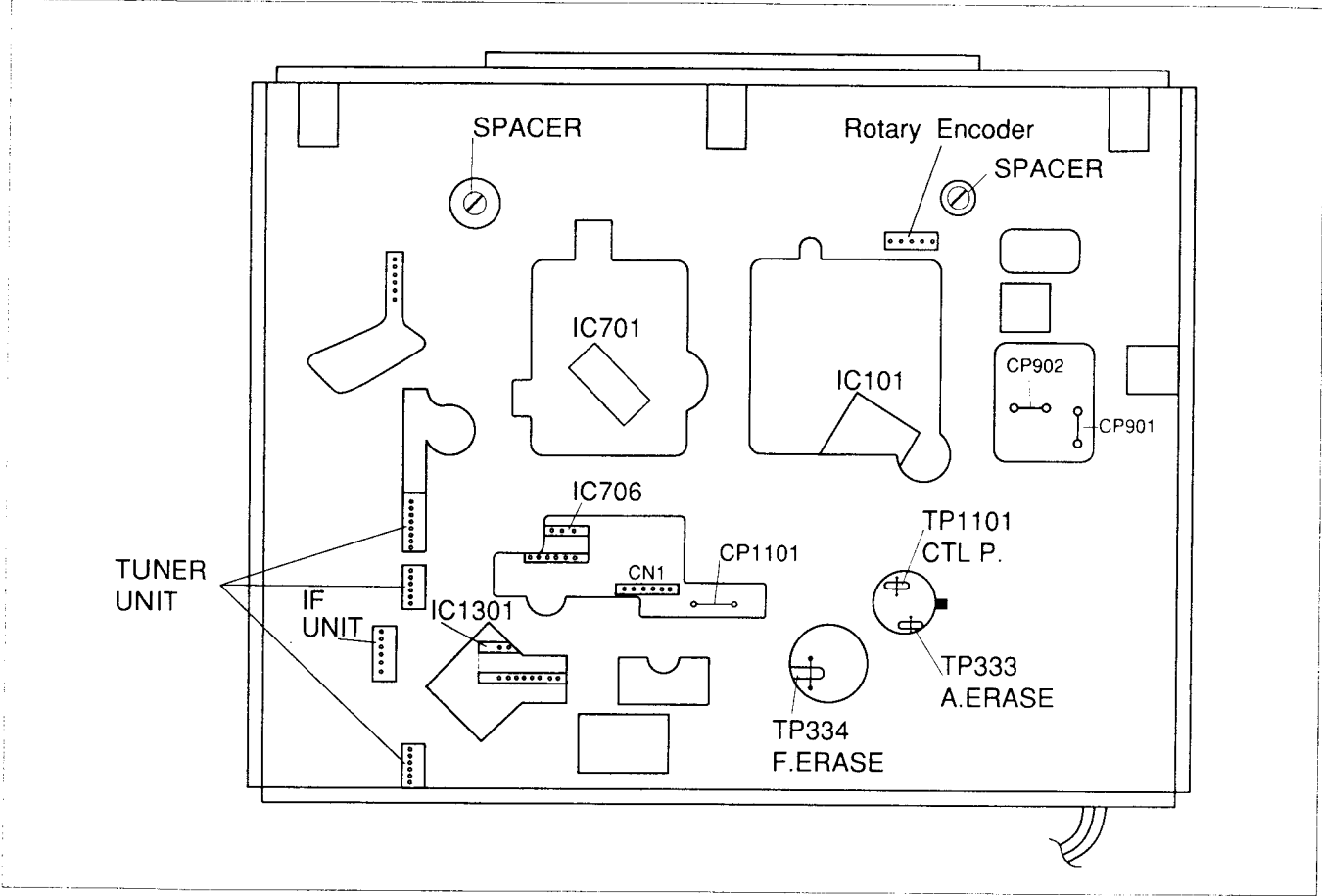


Fig. 1-5-4

1.6 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

1.6.1 How to set the "MECHANISM SERVICE MODE"

- (1) Disconnect VCR from AC.
- (2) Remove the Top cover, Front panel assembly and cassette housing assembly. (See Page 1-2, 1-3)

- (3) Connect TP1202 (GND) and TP1201 (TEST) on the SW/DISPLAY board assembly with a jump wire.
- (4) Connect VCR to AC.
- (5) Press the POWER button.
- (6) Select the desired operation modes with the operation buttons or remote controller.

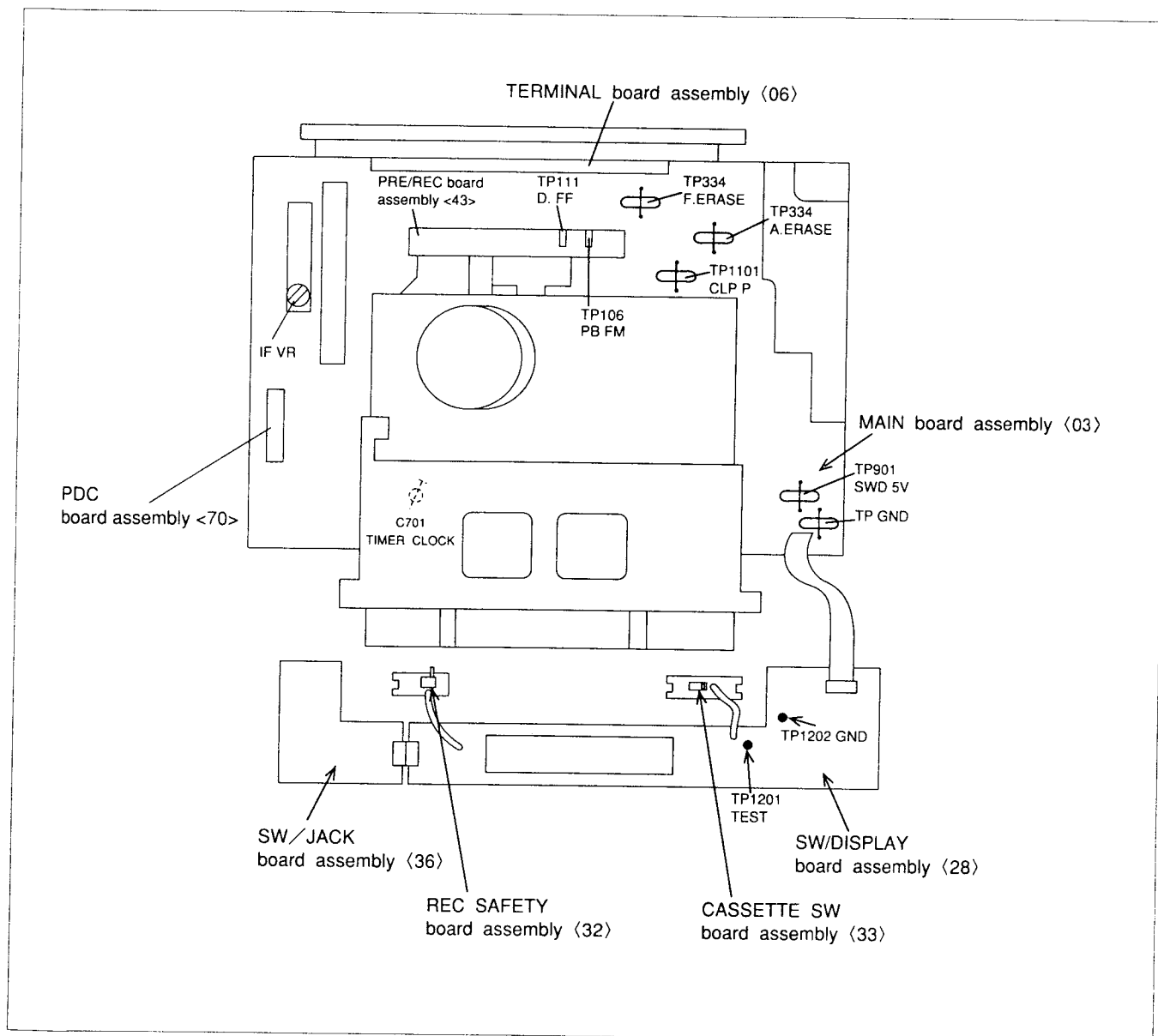


Fig. 1-6-1

1.7 EMERGENCY DISPLAY FUNCTION

This product has the function to store the last two previous emergency faults which can be displayed in the FDP when servicing.

1.7.1 How to display record of an emergency faults

- (1) Press "N" button of the presetting unit more than 2 seconds, and the two previous emergency faults are shown in the FDP.
- (2) Press "N" button of the presetting unit again when return the normal mode.

[Example] E : 01 : 03

Emergency faults before last
Emergency faults of the last time

[Example] E : — : — ← No record of emergency

1.7.3 How to clear emergency record

Press the COUNTER RESET button on the remote controller in the emergency record display mode, and the record of the emergency fault(s) is cleared.

1.7.2 Detail of emergency faults

FDP	Symptom	Detect mode	Resulting mode
E : 01	Loading motor rotates for more than 8 Sec without shift to next mode.	Loading	POWER OFF
E : 02	Loading motor rotates for more than 8 Sec without shift to next mode.	Unloading	POWER OFF
E : 03	TU REEL FG input is absent(for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 04	DRUM FF input is absent(for more than 3 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP
E : 06	CAPSTAN FG input is absent(for more than 1 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 07	No SWD5V/12V	POWER ON	POWER OFF

Table 1-7-1 EMERGENCY FAULTS

SECTION 2

MECHANISM ADJUSTMENT

2.1 PREPARATION

2.1.1 Precautions

- (1) Disconnect VCR from AC power before soldering.
- (2) Avoid imparting stress to wires when disengaging connectors.
- (3) Determine and correct the cause of difficulty before proceeding to adjustments. Do not disturb settings unnecessarily.
- (4) Use care not to damage tabs, claws, etc during repairs.
- (5) Install the cassette housing assembly only when the mechanism is in the MECHANISM ASSEMBLING MODE position.
- (6) When installing the Front panel assembly, be sure to engage the housing door with the door opener of the cassette housing assembly.
If this is omitted, the cassette door will not open at Eject and the cassette can not be removed. (See SECTION 1 DISASSEMBLY.)

2.1.2 Check without cassette housing assembly.

Mechanism operations can be observed easily by removing the cassette housing assembly. Use the MECHANISM SERVICE MODE. (See SECTION 1 DISASSEMBLY.)

2.1.3 Manual removal of loaded tape

When the deck enters the emergency mode with cassette tape loaded and it can not be ejected by pressing the EJECT button, take out of the cassette tape according to the following procedure.

- (1) Disconnect the power cord from AC outlet then take out the Top cover and Front panel assembly.
- (2) Turn the mode motor on the Main deck assembly by hand in the unloading direction to where the pole base assembly (supply and take-up) is positioned below the cassette tape. At that time, pay careful attention to the tape not to get soiled with grease.
- (3) Take out 4 screws of the cassette housing assembly. (See SECTION 1 DISASSEMBLY.)
- (4) Remove the cassette housing with slackened tape and guard panel of cassette.
- (5) Wind up the tape by turning the reel hub (either supply or take-up side for convenience) from the bottom of the cassette, and remove the cassette tape.

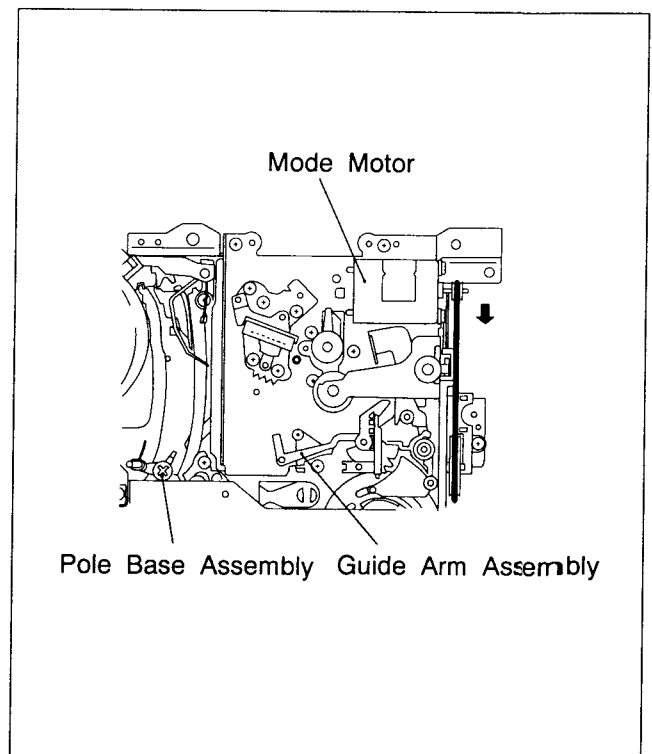


Fig. 2-1-1

2.1.4 Test Equipment

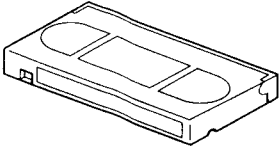
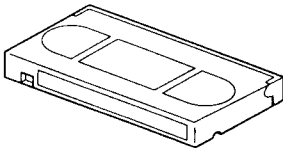
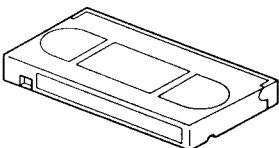
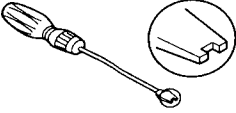
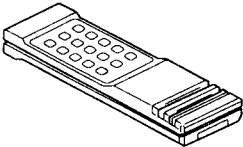
Alignment tape (SP) MHPE	Alignment tape (LP) MHPE-L	Back tension cassette gauge PUJ48076-2	A/C head positioning tool PTU94010
			
Roller driver PTU94002	Presetting unit PTU94008	Grease KYODO-SH-P	
			

Table 2-1-1 Test equipment

2.2 MAIN MECHANISM PARTS

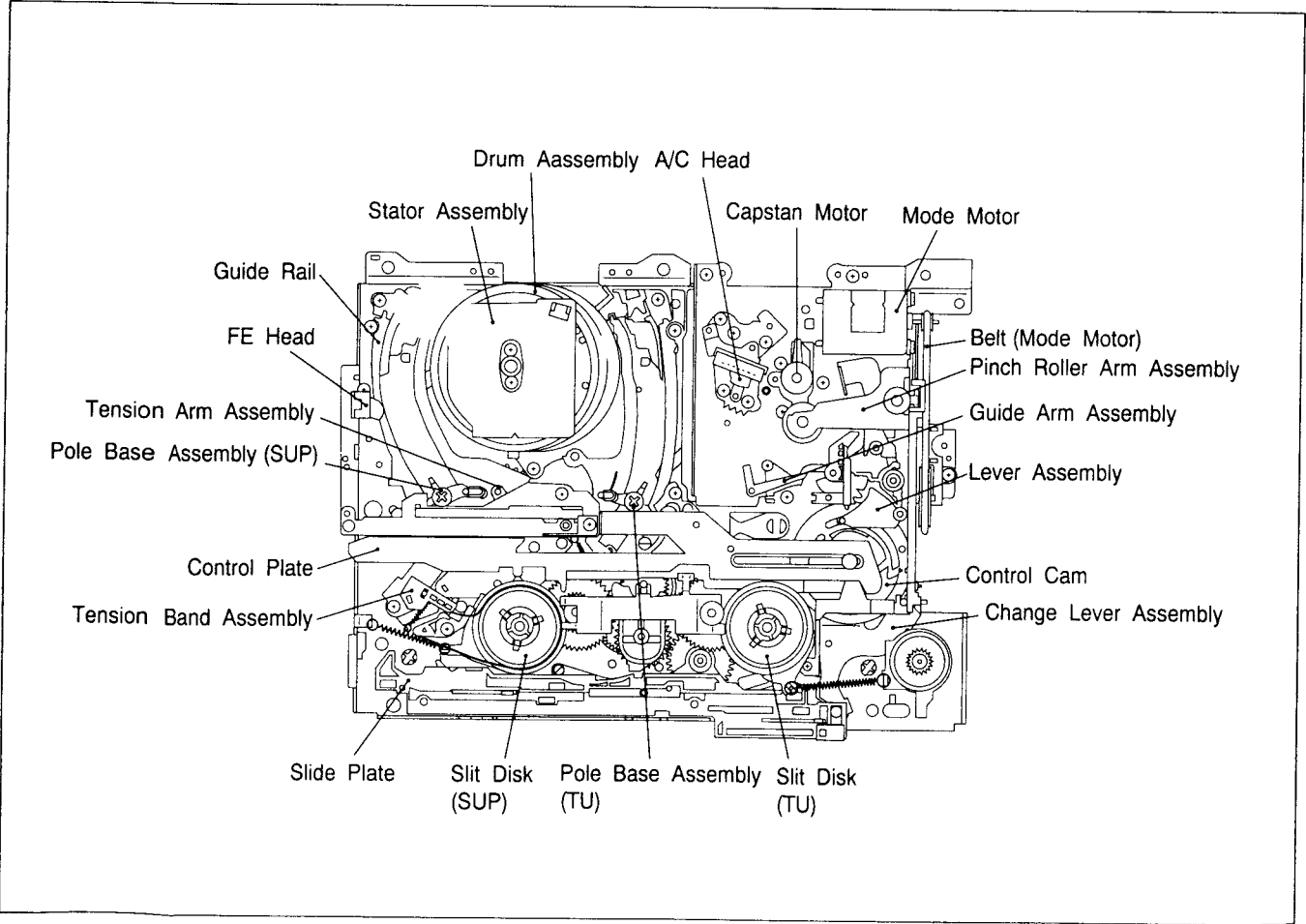


Fig. 2-2-1 Top view of main deck

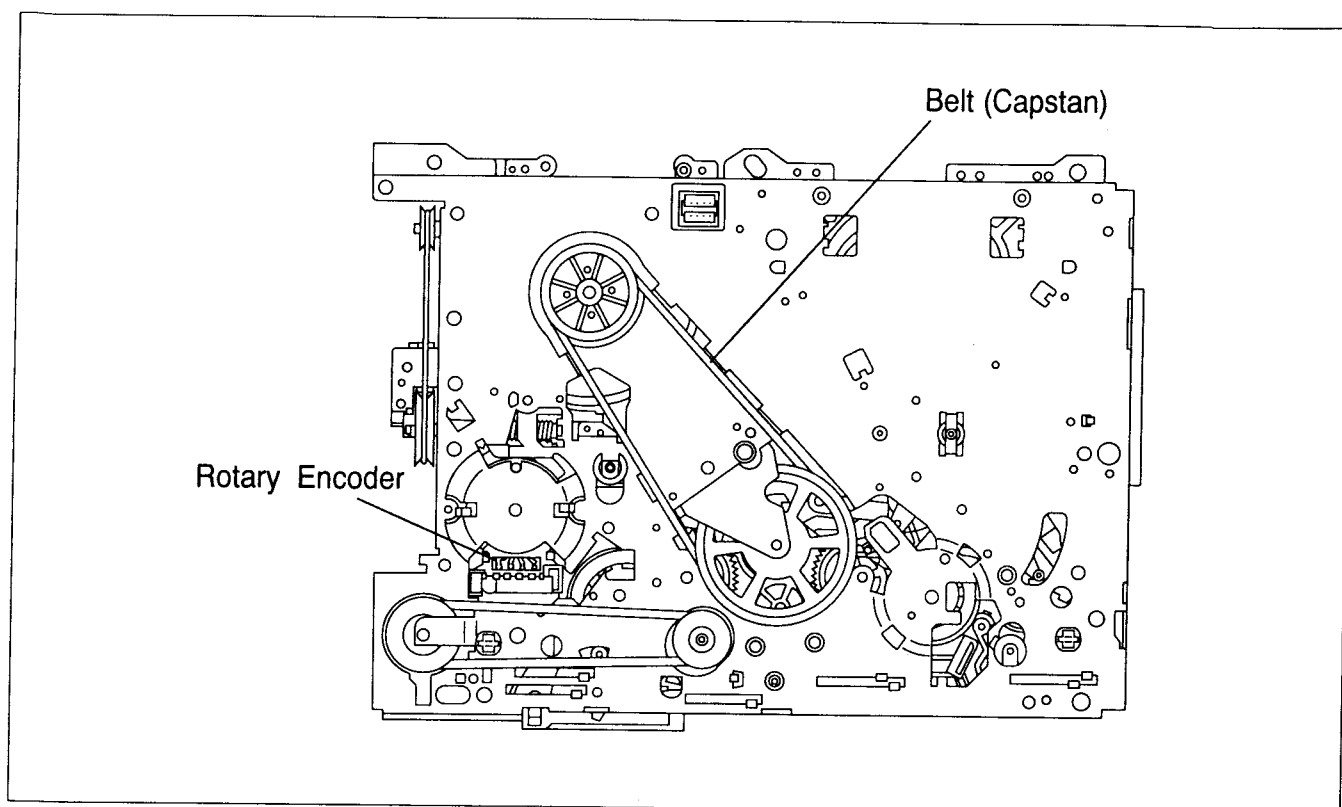


Fig. 2-2-2 Bottom view of main deck

2.2.1 Cleaning

Periodic cleaning of the tape transport system is desirable, but usually not feasible in practice. Therefore, perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads, tape guides and brush can detract from playback picture quality and in extreme cases, even damage the tape. For cleaning, use a finemesh cotton cloth (about the texture of a white dress-shirt) moistened in alcohol. It is recommended to also clean the tape tension posts and capstan.

- To clean the video heads, press the moistened cloth gently against the upper drum with fingertip and turn the drum by hand.
- Do not use a vertical stroke, as this may damage the heads.

2.2.2 Lubrication

Oil and grease do not normally require periodic replenishing. Apply only when replacing lubricated parts (also clean and replace lubrication of mating parts if soiled). For parts and points to apply oil and grease, refer to the exploded views of the mechanism assembly. Before oiling, clean with alcohol. Apply one or two drops of oil. Avoid excess oil.

1. Table 2-2-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

Category	Part No.
Oil	COSMO-HV56
Grease	KYODO-SH-P

Table 2-2-1

2. Grease is not required for a replacement cassette housing assembly, as this has been applied at the factory.

NOTE : Stir grease that has been stored for an extended period.

2.3 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear out in the course of usage. Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced as and when required.

2.3.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time, even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assembly	★ ○	○
	A/C head	★ ○	★ ○
	Lower drum motor assembly	★	★ ○
	Pinch roller arm assembly	★	★
	Full erase head	★	★
	Tension arm assembly	★	★
	Guide arm assembly	★	★
Drive	Capstan motor		○
	Belt (Capstan)	○	○
	Belt (Mode motor)		○
	Mode motor		○
	Slit disk (supply, take-up)		○
	Clutch unit (supply, take-up)		○
	Worm gear assembly		○
	Control plate		○
	Slide plate		○
Other	Brush assembly	★ ○	★ ○
	Tension band assembly	○	○
	Rotary encoder		○

★ : Cleaning

○ : Inspection or Replacement if necessary

Table 2-3-1

2.4 DISASSEMBLY/ASSEMBLY PROCEDURE OF MECHANISM

2.4.1 Precaution before disassembling mechanism

This mechanism has an exclusive operation mode provided for disassembling and installation of the mechanism (MECHANISM ASSEMBLING MODE), and it is suggested to set the mechanism to this mode before disassembly and installation. The exclusive mechanism operation mode is not generally used and becomes available by manual setting only. Then this procedure starts with the condition that the cabinet parts, cassette housing assembly and PRE/REC board assembly have been removed.

2.4.2 How to set the exclusive mechanism operation mode (MECHANISM ASSEMBLING MODE)

- (1) Turn the mode motor belt by hand.
- (2) Confirm that the hole of the control cam are aligned to the deck hole as shown in Fig. 2-4-1.

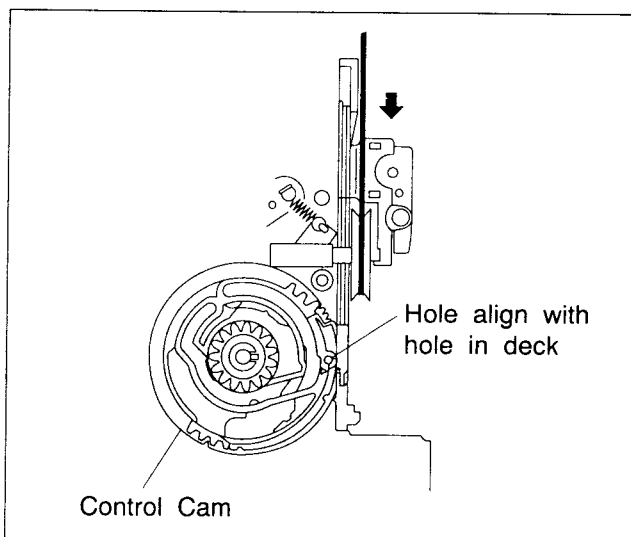


Fig. 2-4-1

2.5 MAIN PARTS REPLACEMENT OF MECHANISM

2.5.1 Pinch Roller Arm Assembly

- (1) Remove the slit washer.
- (2) Tilt up the pinch roller assembly in direction of arrow.

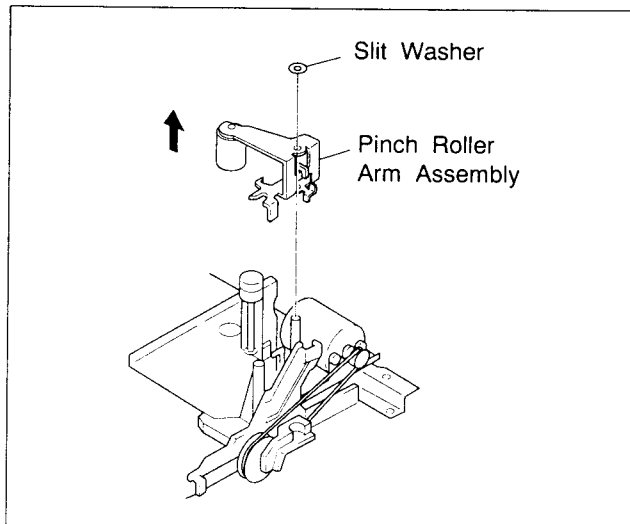


Fig. 2-5-1

2.5.2 A/C Head

1. Removal

- (1) Take out 2 screws (A).
- (2) Remove the A/C head with head base.

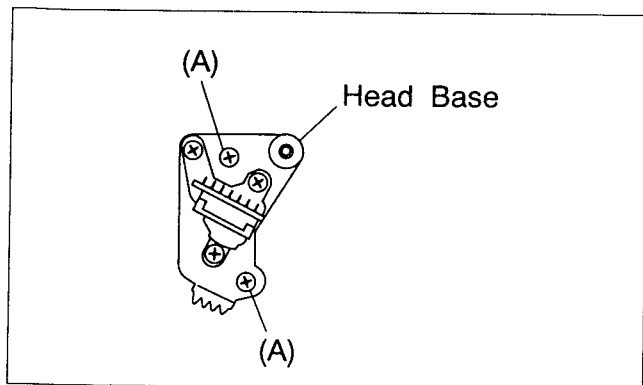


Fig.2-5-2

- (3) When replacing the A/C head only, remove 3 screws (B), use care not to misplace the 3 springs.

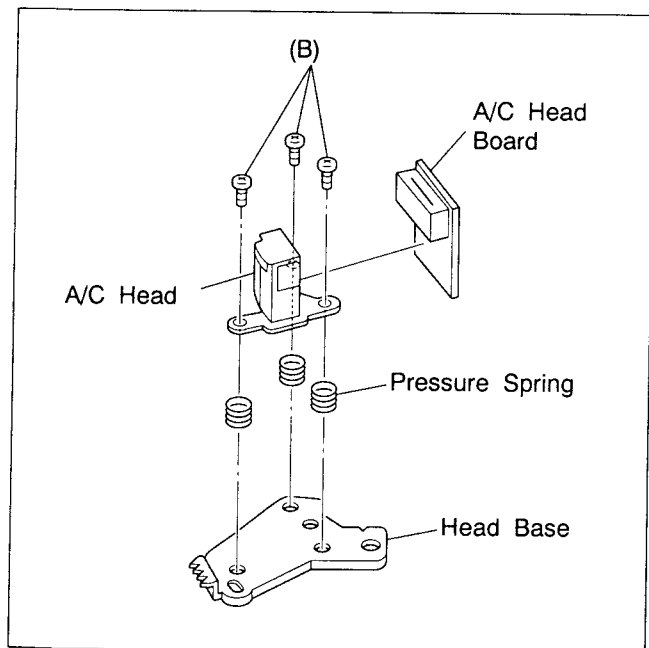


Fig.2-5-3

2. Installation

- (1) Temporarily set A/C head height as indicated in Fig. 2-5-4.

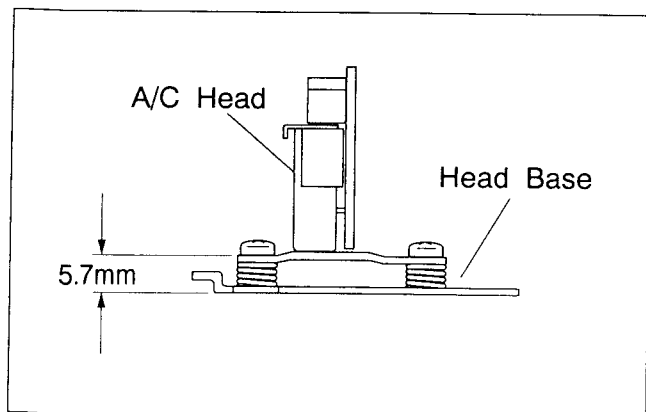


Fig.2-5-4

NOTES:

- It is very important to correctly adjust the control pulse and audio signal in addition to the mechanical tape path.
- Perform interchangeability adjustments after electrical adjustments.

2.5.3 Pinch Plate

1. Removal

- (1) Disengage 2 claws, then remove the pinch plate.

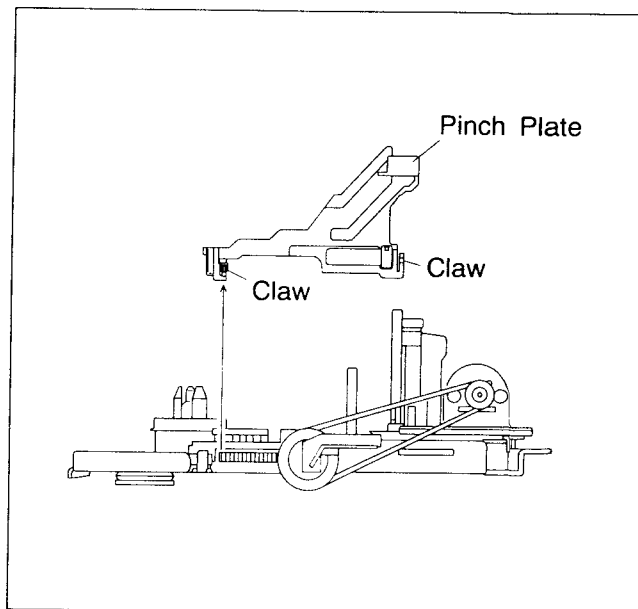


Fig.2-5-5

2. Installation

- (1) When installing pinch plate, align rack of pinch plate and triangle mark of control cam as indicated in Fig.2-5-6.

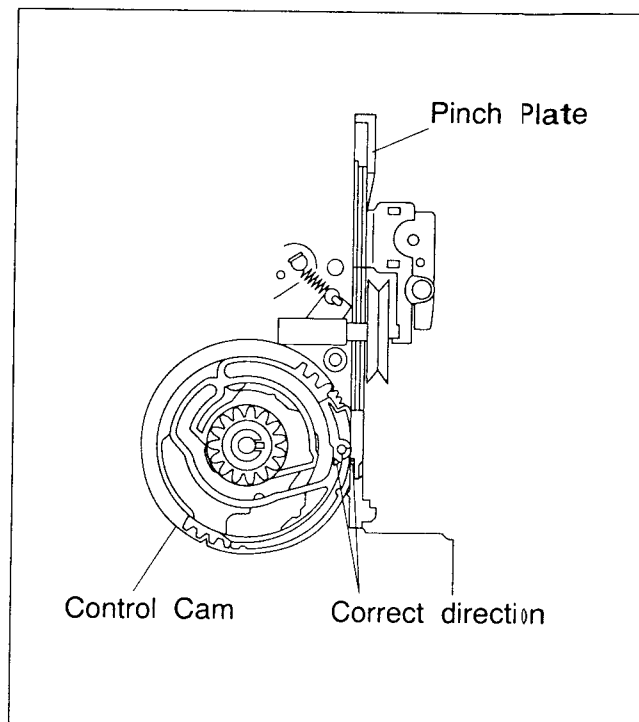


Fig. 2-5-6

2.5.4 Mode Motor

- (1) Disengage the belt between mode motor and worm gear.
- (2) Take out 2 screws (A) then remove the mode motor.

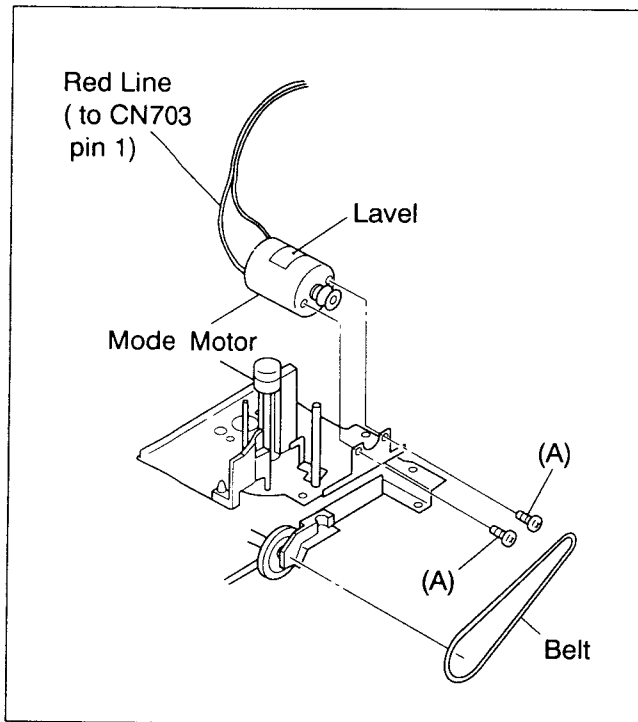


Fig.2-5-7

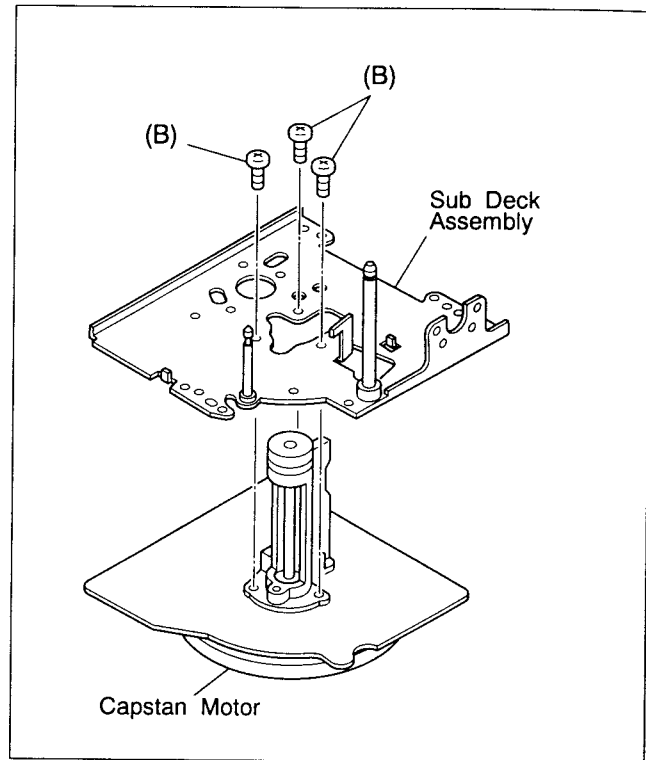


Fig.2-5-9

2.5.5 Lever Assembly, Sub Deck Assembly, Capstan Motor

- (1) Take out 1 slit washer, then remove the lever assembly.
- (2) Disengage the belt (capstan motor) from bottom of mechanism assembly first as indicated in Fig.2-5-10.
- (3) Take out 3 screws (A) and remove the sub deck assembly as indicated in Fig.2-5-8.
- (4) Take out 3 screws (B) and remove the capstan motor from the sub deck assembly as indicated in Fig.2-5-9.

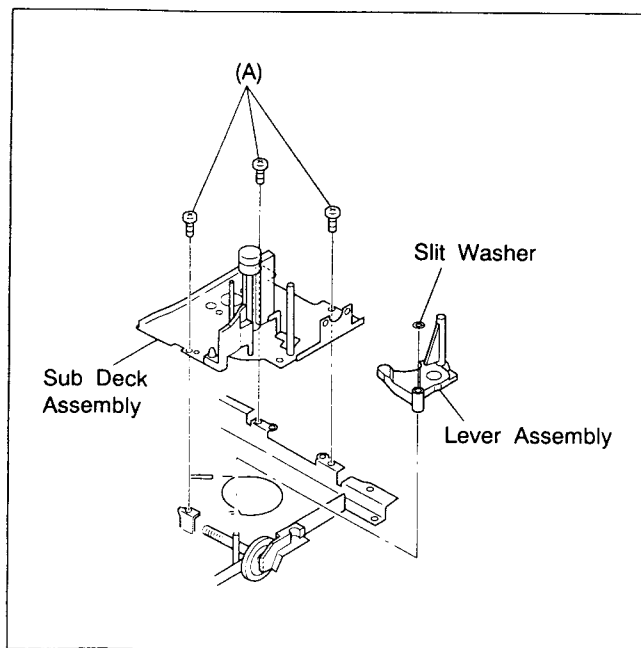


Fig.2-5-8

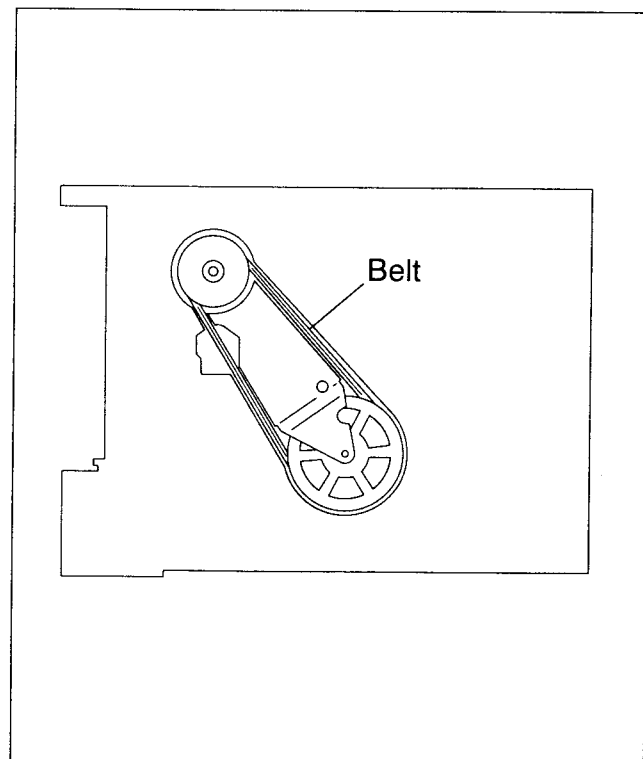


Fig.2-5-10

2.5.6 Control Bracket-1,Earth Plate

- (1) Take out 1 screw (A) and 1 screw (B).
- (2) Remove the control bracket-1 and earth plate.

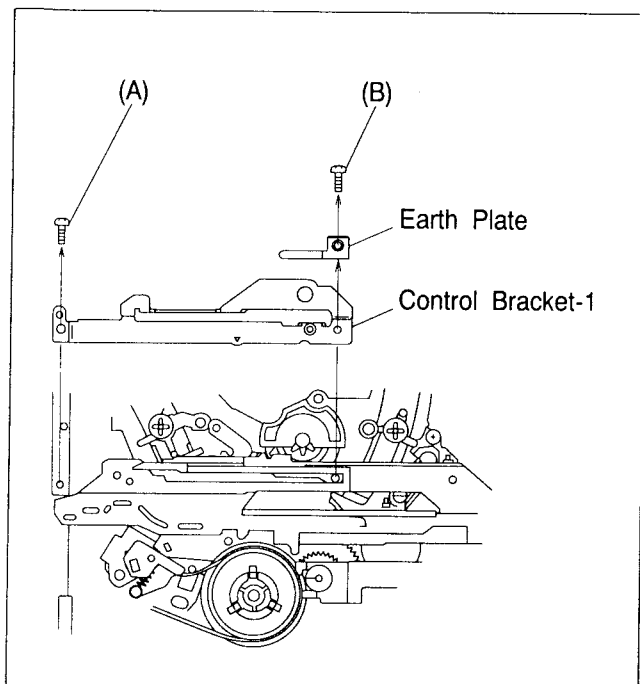


Fig.2-5-11

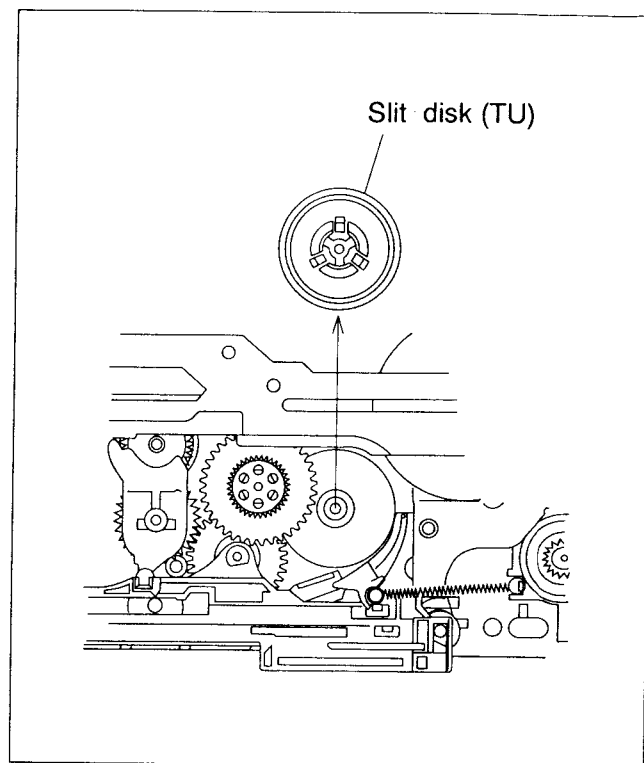


Fig.2-5-13

2.5.7 Reel Bracket,Slit disk (take-up)

- (1) Take out 2 slit washers.
- (2) Remove the reel bracket and slit disk(take-up).

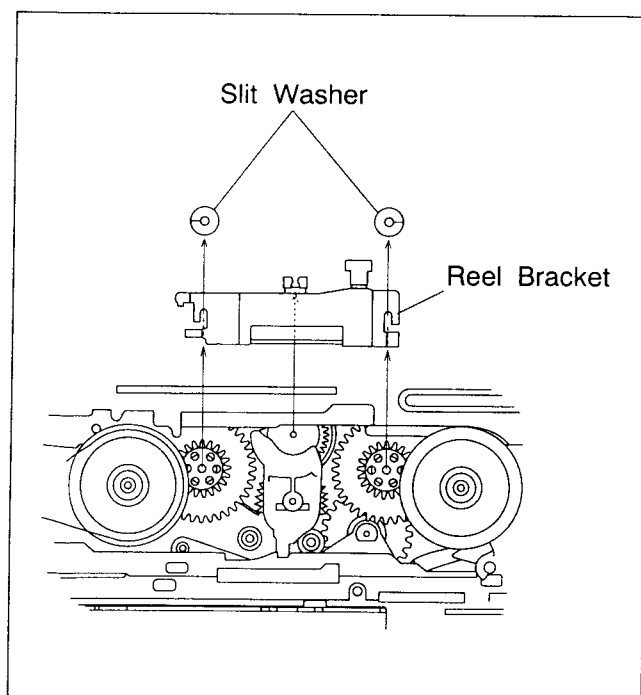


Fig.2-5-12

2.5.8 Control Bracket-2,Control Plate

- (1) Take out 1 screw (A) and remove the control bracket-2.
- (2) Take out 1 slit washer.
- (3) Disengage 2 claws and remove the control plate.

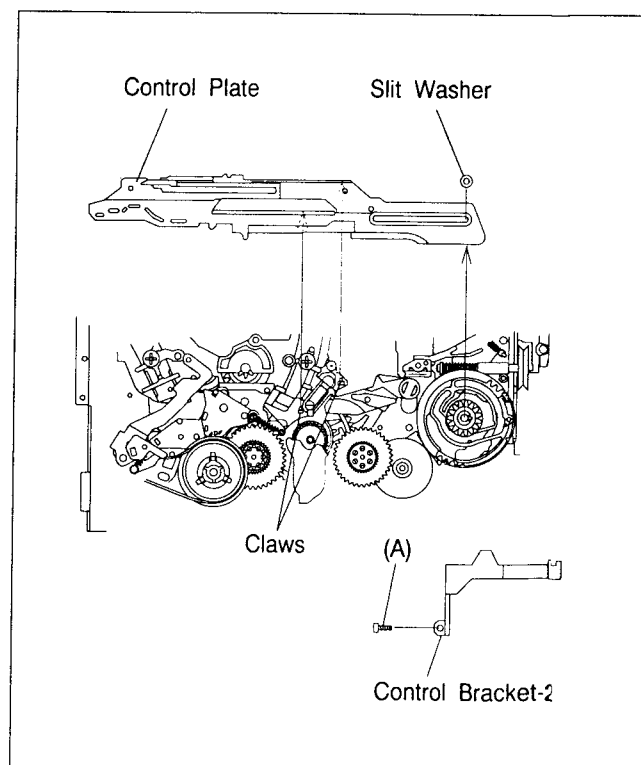


Fig.2-5-14

2.5.9 Sub Brake(take-up),Control Cam

- (1) Disengage 1 spring (a) and 1 claw then remove the sub brake (take-up).
- (2) Disengage 1 claw and remove the control cam.

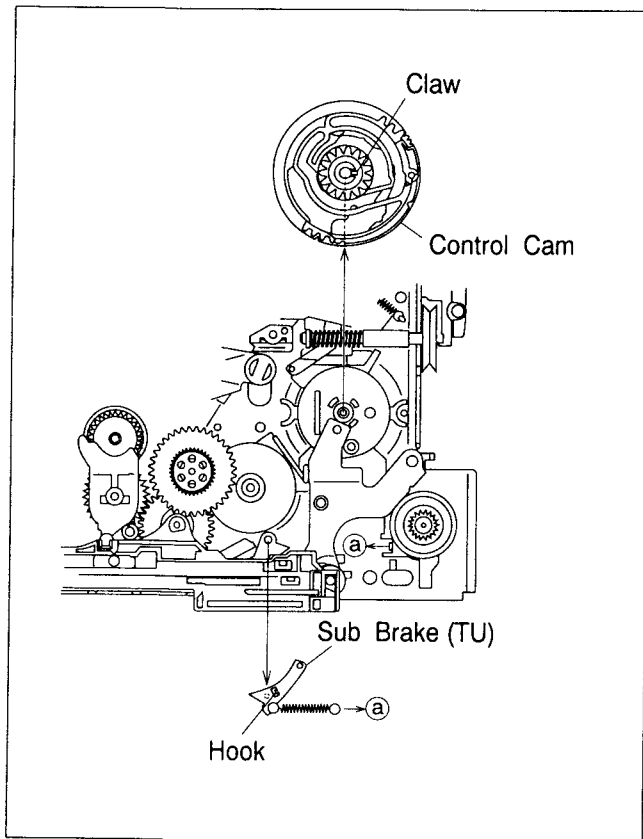


Fig.2-5-15

2.5.10 Slide Plate

- (1) Disengage 7 claws from bottom of the mechanism assembly and remove the slide plate.

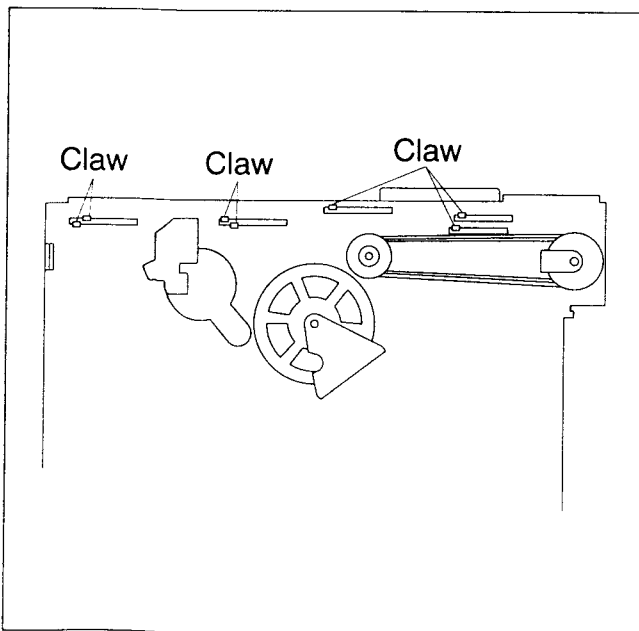


Fig. 2-5-16

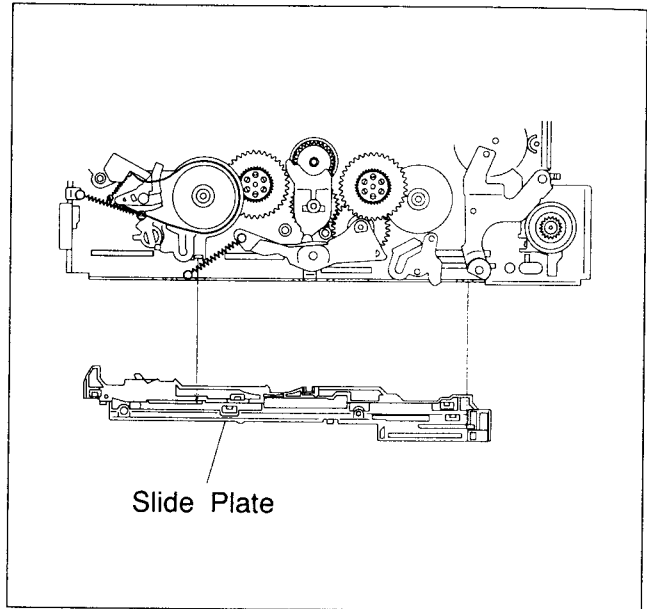


Fig. 2-5-17

2.5.11 Change Lever,Rotary Encoder

- (1) Remove the change lever.
- (2) Disengage 2 claws and remove the rotary encoder.

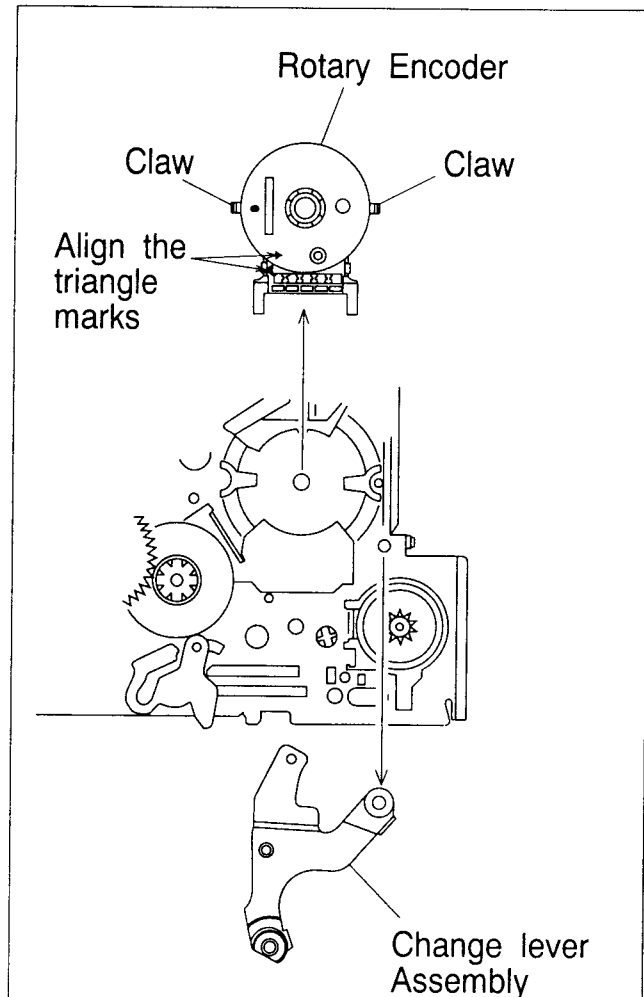


Fig. 2-5-18

2.5.12 Sub Brake (supply),Tension Band Assembly,Tension Arm Assembly,Take-up Lever Assembly,Slit Disk(supply)

- (1) Disengage 1 spring (a).
- (2) Disengage 1 claw and remove the sub brake (supply).
- (3) Take out 1 screw (A),spring (c) and slit washer.

- (4) Remove the tension arm assembly with tension band assembly.
- (5) Disengage 1 spring (b) and remove the take-up lever assembly.
- (6) Remove the slit disk(supply).

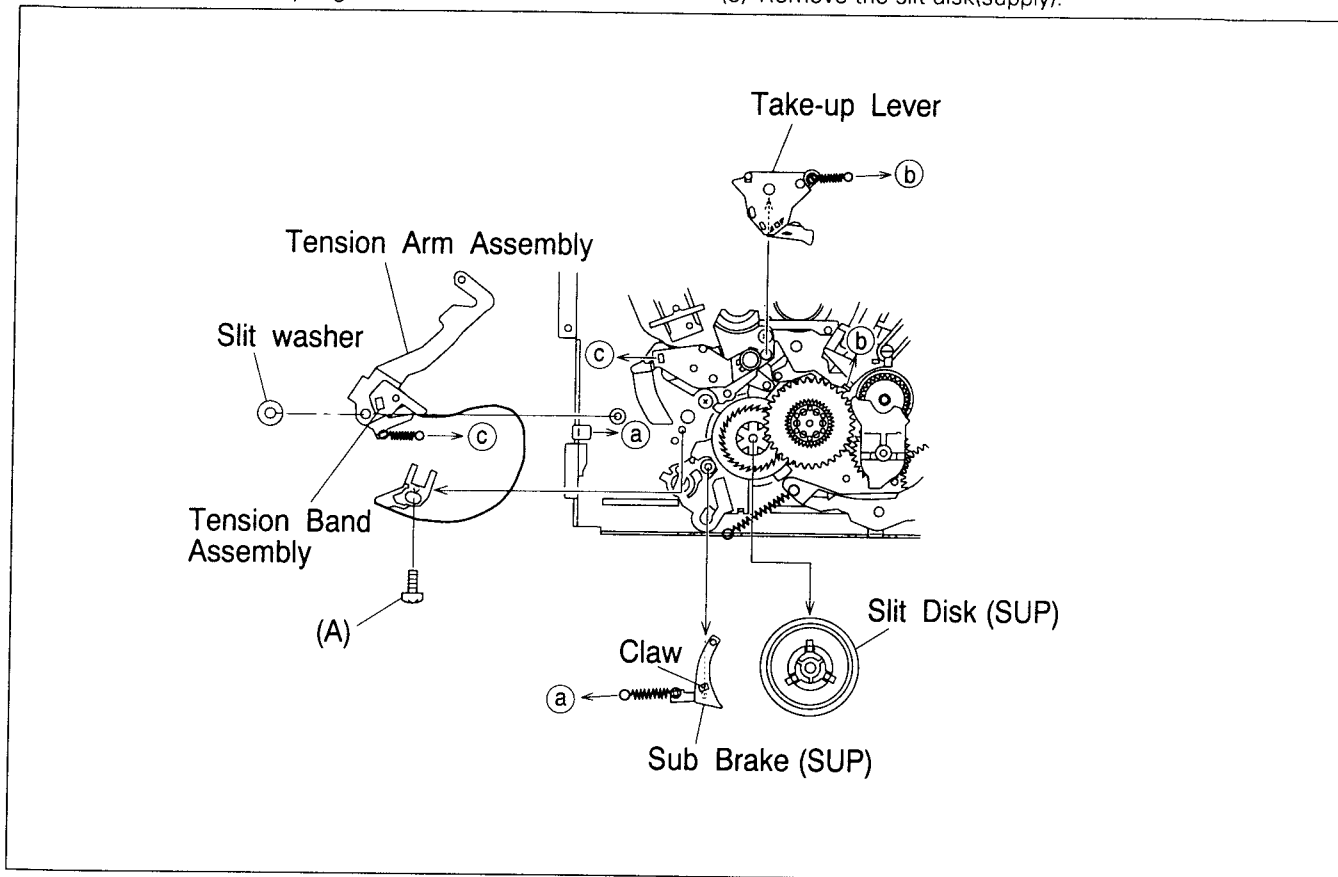


Fig. 2-5-19

2.5.13 Take-up Head,Tension Arm Lever

- (1) Remove the take-up head and tension arm lever.

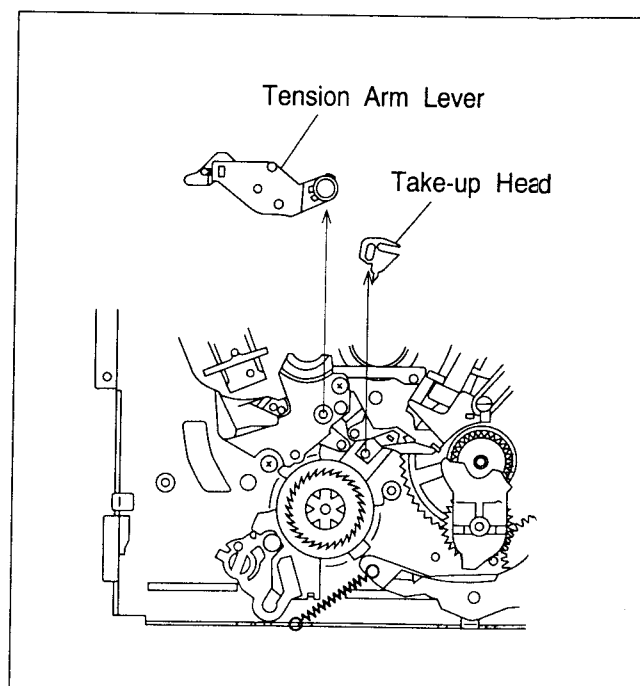


Fig.2-5-20

2.5.14 Guide Rail

- (1) Take out 5 screws (A) and 1 screw (B).
- (2) Disengage 4 claws and remove the guide rail.

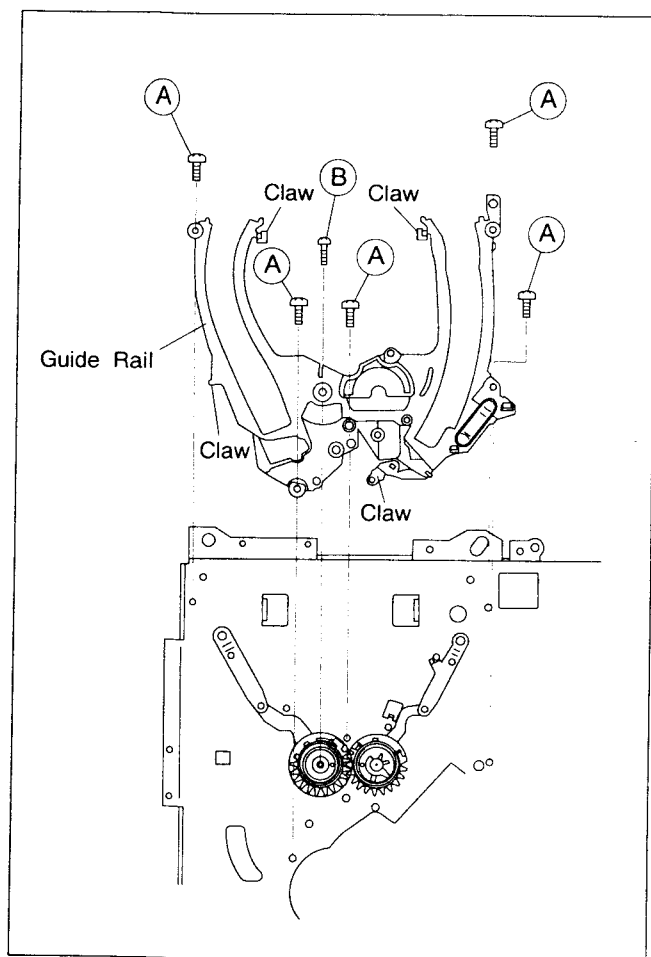


Fig. 2-5-21

2.5.15 Stator Assembly

- (1) Take out 2 screws (A).
- (2) Raise the stator assembly in the direction indicated by the arrow to remove it.
- (3) Remove the flat cable.
- (4) To reinstall, first secure the flat cable, then insert 2 screws (A).
- (5) After reinstalling, be sure to perform PB switching point adjustment (See SECTION 3 ELECTRICAL ADJUSTMENT).

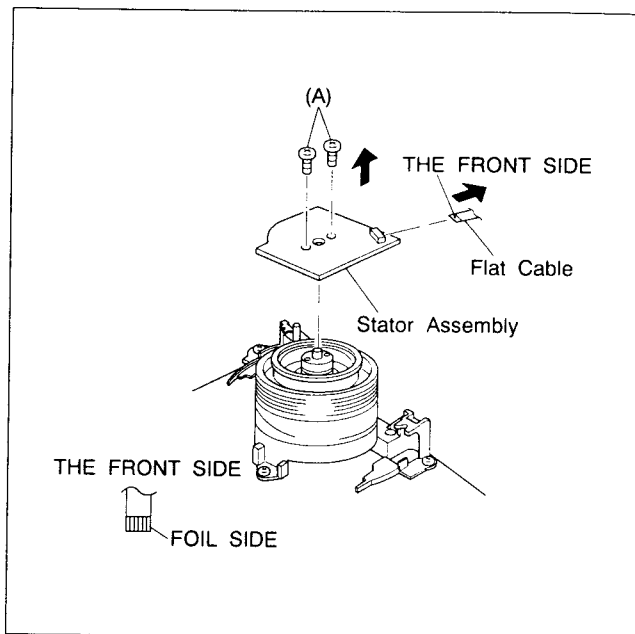


Fig. 2-5-22

NOTE : When refitting the connector, check that the flat wire is inserted correctly.

2.5.16 Rotor Assembly

- (1) Remove the stator assembly.
- (2) Take out 2 screws (B) and remove the rotor assembly.

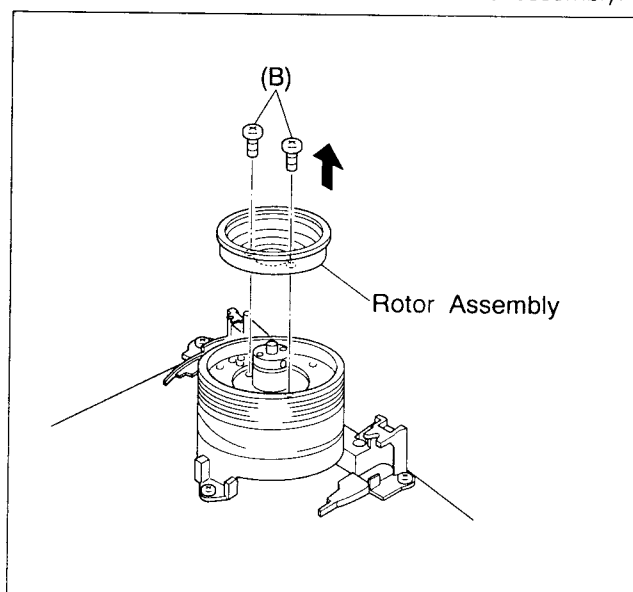


Fig. 2-5-23

- (3) Align the upper drum assembly and rotor assembly phase as indicated in Fig.2-5-22.
- (4) Overlap holes (a) of the upper drum assembly with holes (b) of the rotor assembly (align holes in 3 locations) and secure with 2 screws (B) as indicated in Fig.2-5-21.

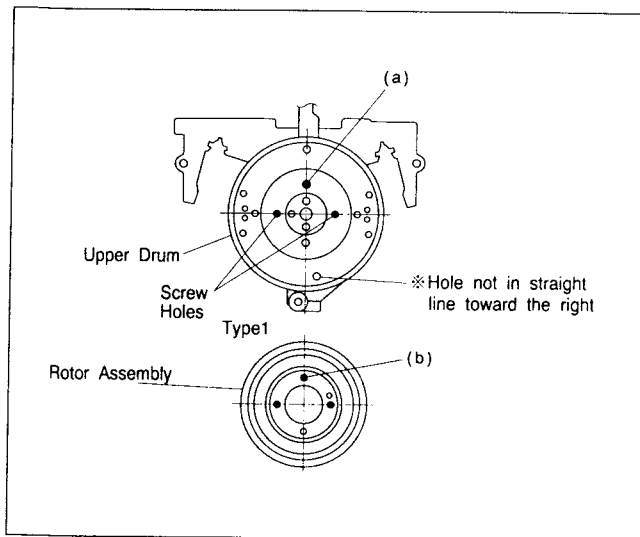


Fig. 2-5-24

2.5.17 Upper Drum Assembly

1. Removal

- (1) Remove the stator assembly and rotor assembly.
- (2) Use a 1.5 mm hexagonal wrench to loosen the collar assembly screw and remove the collar assembly.
- (3) Remove the upper drum assembly and use tweezers to remove the Washer.

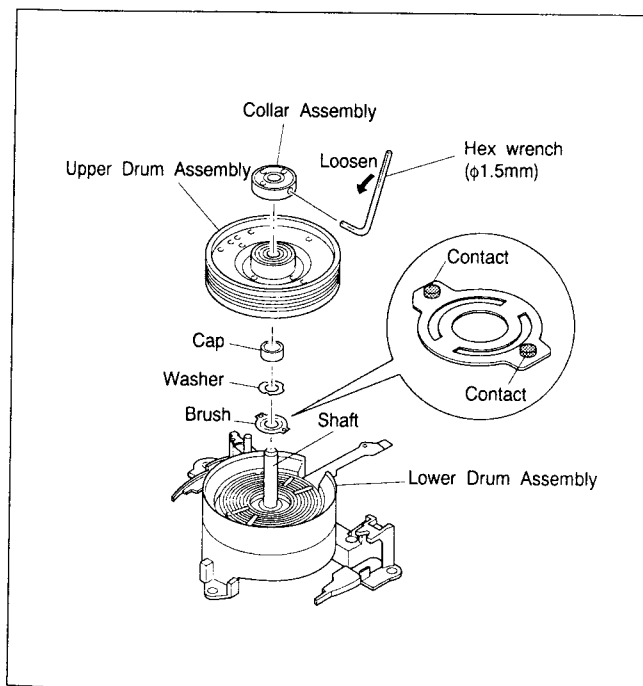


Fig. 2-5-25

NOTE : If the Brush is replaced, do not apply the grease to the contacts.

2. Installation

- (1) Use an air brush to clean the lower drum assembly and the coil section of the new upper drum assembly.
- (2) Set a new washer on the drum shaft as indicated in Fig.2-5-25.

NOTE : Be sure to use the new washer when replace the upper drum assembly.

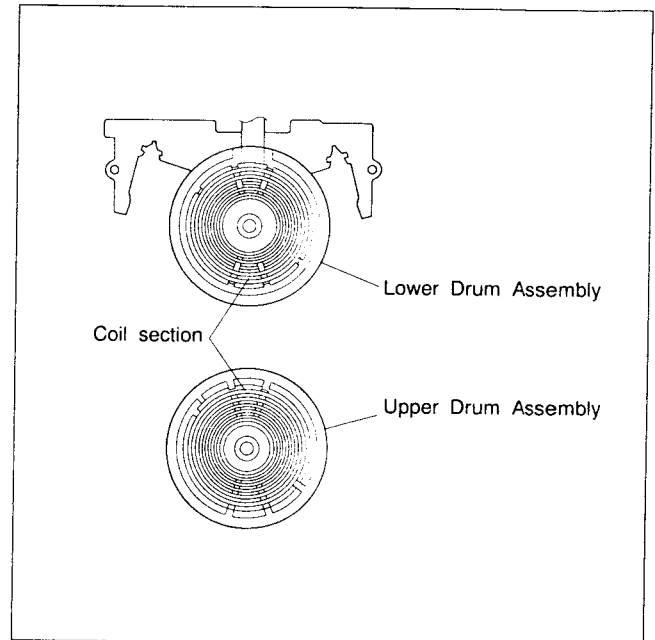


Fig.2-5-26

- (3) Note the top and bottom of the collar assembly and determine the position as indicated in Fig.2-5-25.

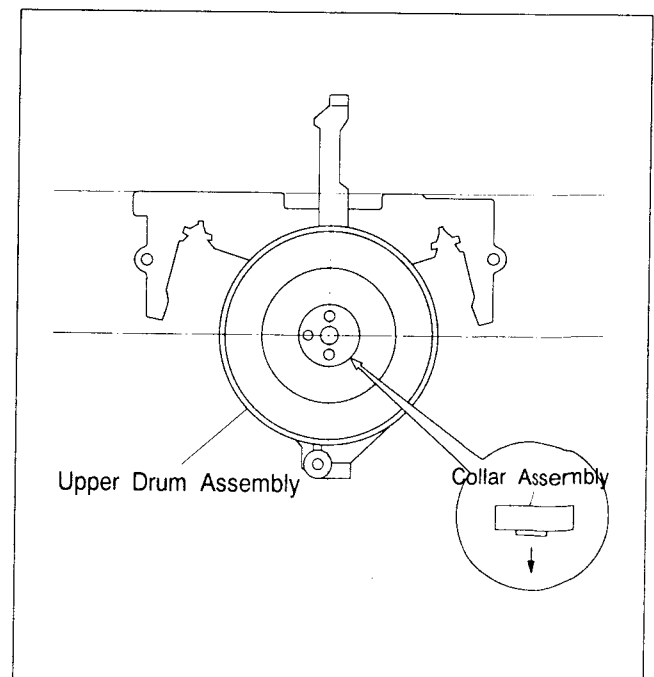


Fig.2-5-27

- (4) While pressing the collar assembly evenly from above with your fingertips, secure the hexagonal screw.

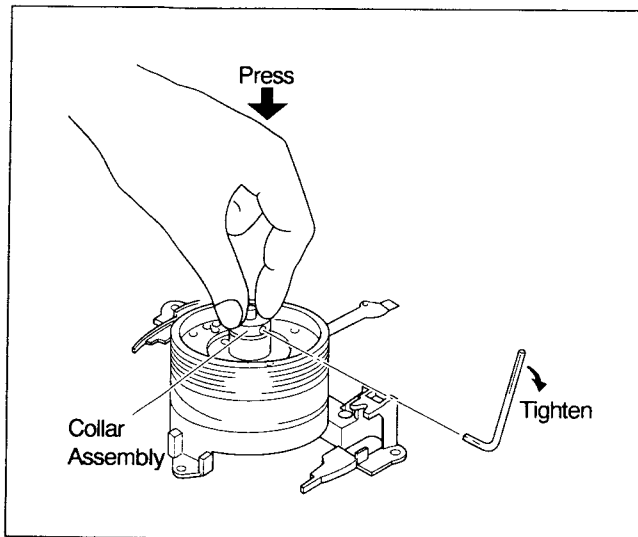


Fig.2-5-28

- (5) After installing, gently turn the upper drum by hand and confirm normal rotation.
- (6) Install the rotor assembly and stator assembly.
- (7) Clean the upper and lower drum assemblies and perform the following adjustments;
- PB switching point adjustment
 - Slow tracking preset adjustment
 - Interchangeability adjustment (be sure to check LP mode)

2.6 CHECKUP AND ADJUSTMENT OF MECHANISM PHASE

2.6.1 Precaution

The rotary encoder and syscon circuit are closely interrelated. Therefore, the rotary encoder and control cam connection determines the operations of mechanical parts such as plates, gears, brakes, etc. Correct positioning of these parts is essential for smooth tape loading and mechanical operations.

2.6.2 Loading Arm Assembly (supply, take-up)

- (1) Install the supply loading arm assembly and the take-up loading arm assembly so that their positioning markings on the respective gear face each other and the holes of their arms correspond to the holes on the main deck assembly respectively.
- (2) After setting the guide rails, engage the pole base assemblies with the tip of the loading arms respectively. Then, enter the mechanism into the unloading mode to return the pole base assemblies to the front position.
- (3) Reassemble the peripheral parts of the guide rail to its original position.

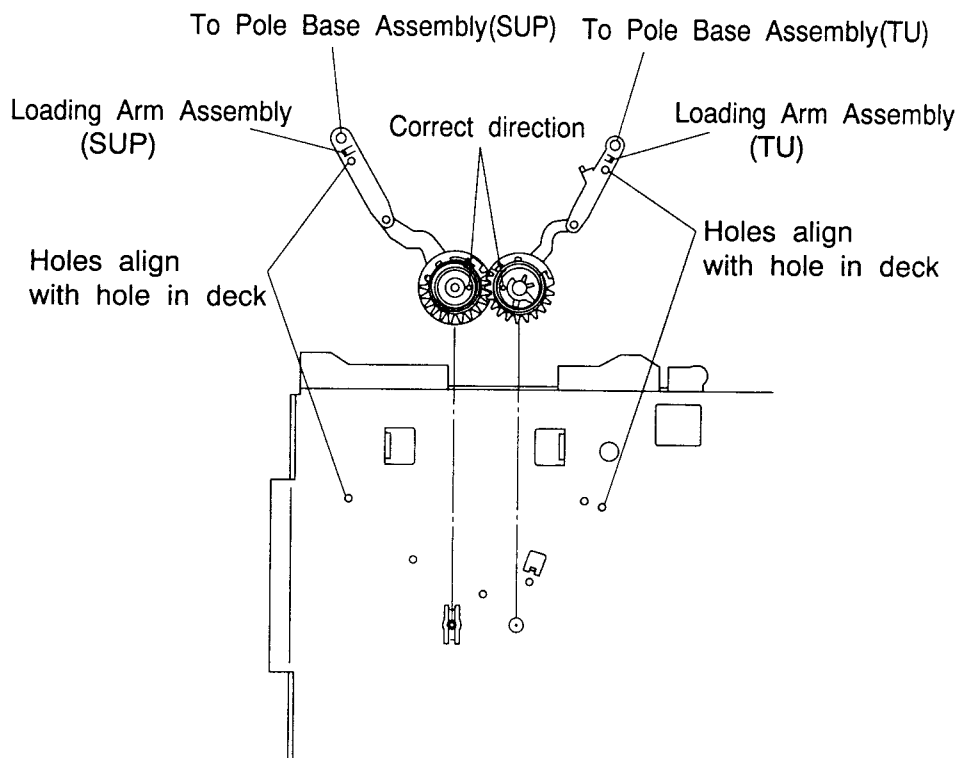


Fig. 2-6-1

2.6.3 Rotary Encoder, Change Lever, Control Cam

- (1) When reinstalling the rotary encoder, adjust its position so as to fit the triangle marks each other and push it deep untill it is locked by the pawls.
- (2) When reinstalling the change lever, set it so as to make its positioning hole correspond to the hole of the main deck assembly.
- (3) When re-engaging the control cam, lower the capstan brake assembly while setting it so as to make its positioning hole correspond to the hole of the main deck assembly.

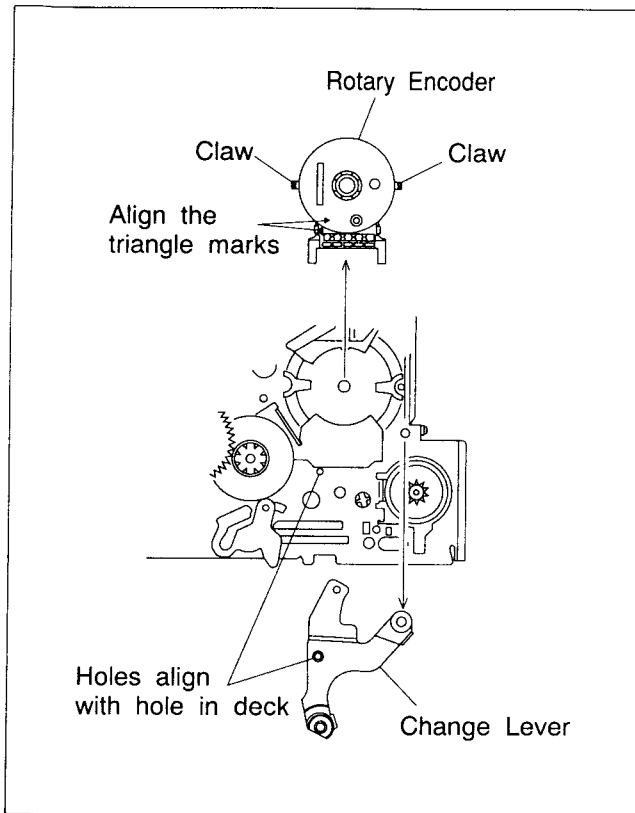


Fig. 2-6-2

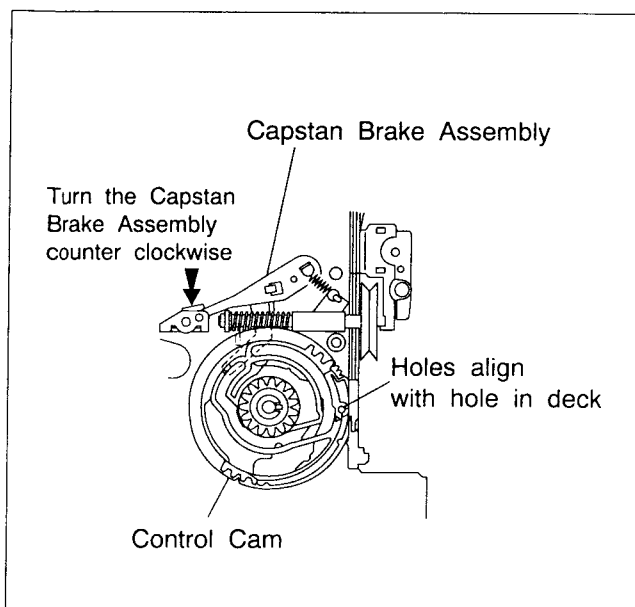


Fig. 2-6-3

2.6.4 Slide Plate

- (1) Lower both the main brake assemblies (supply and take-up) untill they touch the edge of the main deck assembly while reinstalling the slide plate so as to make the respective positioning holes of the main brake assemblies correspond to the holes on the main deck assembly.

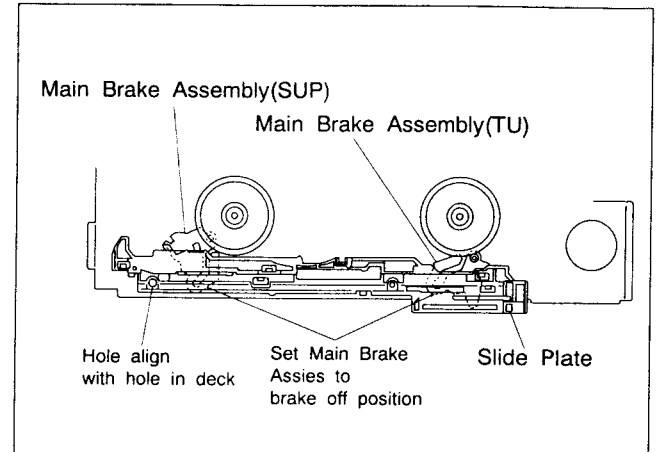


Fig.2-6-4

2.6.5 Control Plate

- (1) Reinstall the control plate so as to set the two positioning holes of it on the holes on the main deck assembly respectively and to set the positioning hole of the take-up lever on the hole of the main deck at the same time. When adjusting the hole position of the take-up lever, use a pair of tweezers to hold and move it since it is pulled by a tension spring.
- (2) After reinstalling the control plate, fix it with the slit washer, control bracket-1 and -2.

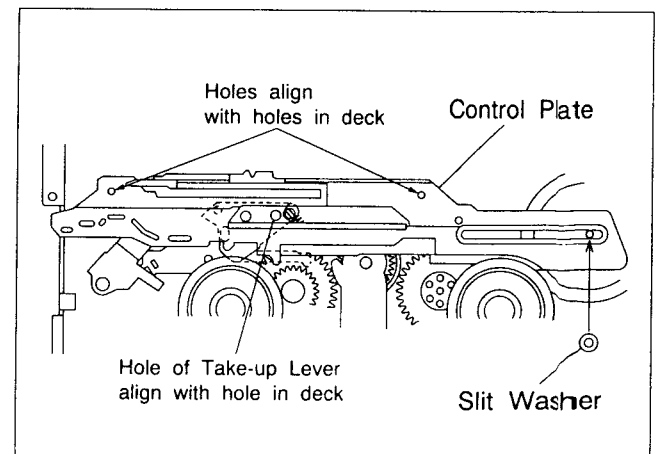


Fig. 2-6-5

2.7 TAPE INTERCHANGEABILITY ADJUSTMENT

- NOTE :**
- This adjustment is extremely important. However, it is normally not required during routine service. Perform only after replacing major components(A/C head,upper/lower drum assembly,pole base assy,etc).
 - Before using costly alignment tape,use a spare tape and confirm correct operation of the tape transport.

2.7.1 Tape pattern

- (1) Connect the oscilloscope to TP106(PB FM) on the PRE/REC board.Use TP111(D.FF) on the PRE/REC board as a trigger.
- (2) Playback the SP stairstep portion of the alignment tape [MHPE].Confirm that the FM waveform appears as indicated in Fig.2-7-1.
- (3) Set the manual tracking position by pressing the **///** button on the remote controller or TV PROG "-" and "+" buttons simultaneously.
- (4) Operate the tracking adjustment (press the TV PROG buttons during playback) and set for maximum playback FM waveform.
- (5) By operating the TV PROG button, vary the FM waveform from maximum to minimum and vice versa to confirm that the waveform varies nearly in a flat shape as shown in Fig.2-7-1.
- (6) When the FM waveform does not remain flat during this process,first slightly loosen the set screw located at the bottom of the guide rollers.Using the guide roller adjustment tool (Roller driver),adjust the supply and take-up guide rollers (refer to Fig.2-7-2) to obtain the correct waveform as indicated in Fig.2-7-3.
- (7) By pressing the TV PROG button several times, vary the FM waveform output from maximum to minimum (and vice versa) gradually,and confirm that the variation proceeds in flat shape, as shown in Fig.2-7-3.
- (8) Record the signal and play it back in the SP mode,confirm that the FM waveform is flat in SP mode.
- (9) After adjustments,tighten the set screw of the guide rollers.
- (10) Confirm that the tape wrinkling does not occur at the roller upper or lower limits as indicated in Fig.2-7-4.

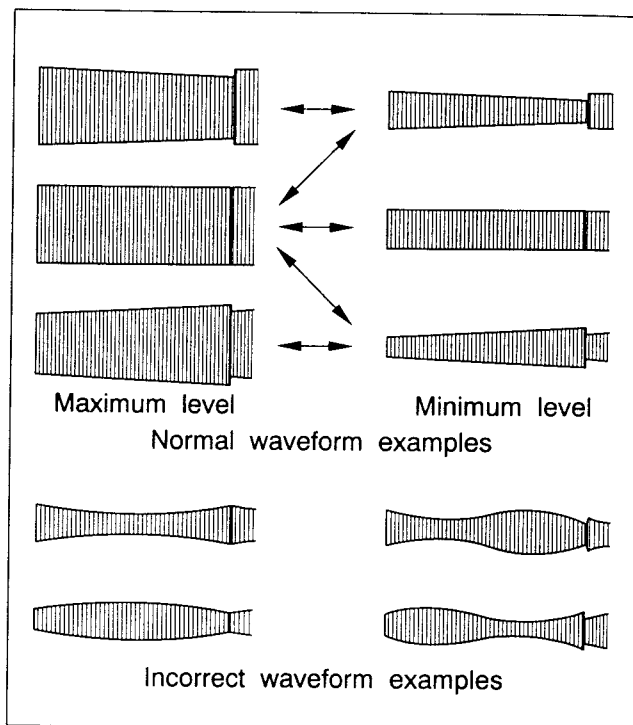


Fig. 2-7-1

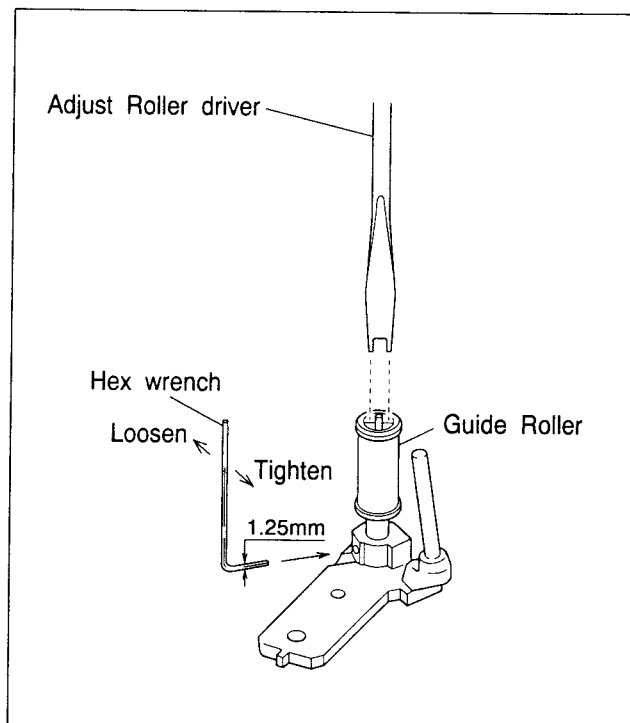


Fig. 2-7-2

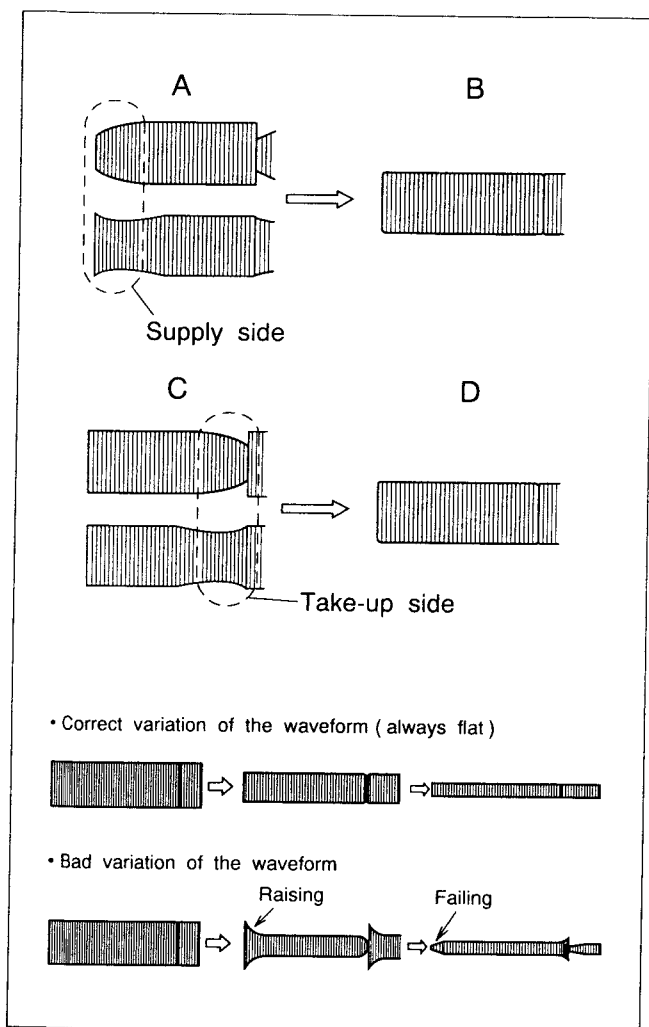


Fig. 2-7-3

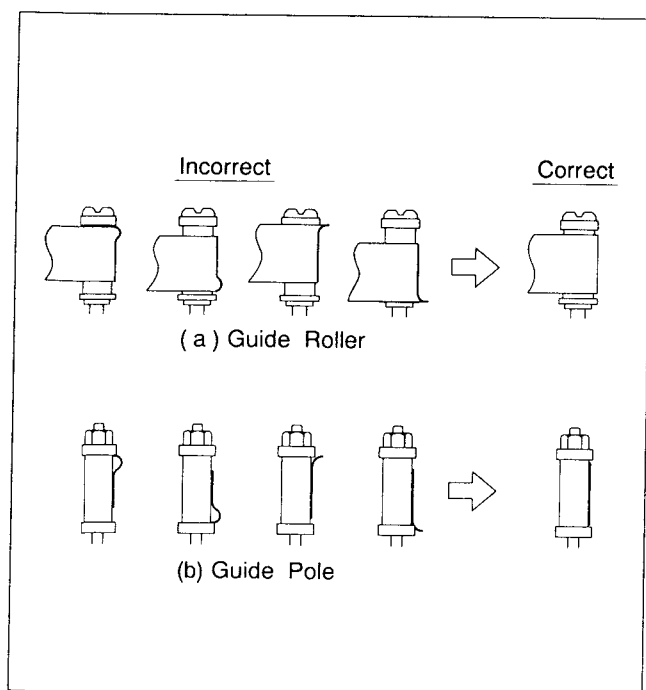


Fig. 2-7-4

2.7.2 A/C head height & azimuth

NOTE :

- Temporarily set A/C head height as indicated in Fig. 2-5-4.
- Use spare tape to check the transport and confirm the tape is not scratched or damaged.

1. Tilt

- (1) Use spare tape and set for playback.
- (2) Turn screw (3) clockwise to where the tape curls just slightly at the TU guide pole bottom flange as shown in Fig.2-7-5.
- (3) Then slowly turn screw (3) counterclockwise to where the curling ceases.

2. Height

- (1) Connect CH-1 of a dual trace oscilloscope to Audio Out.
- (2) Connect CH-2 to TP1101 (CTL PULSE) of the Main board assembly and use the ALT mode.
- (3) Playback the SP stairstep portion of the alignment tape [MHPE].
- (4) Adjust screws (1), (2) and (3) for maximum audio output and control pulse level.

3. Azimuth

- (1) Connect the oscilloscope to Audio Out.
- (2) Playback the SP stairstep portion of the alignment tape [MHPE].
- (3) Adjust screw (2) so that the audio output is both maximum and with minimum fluctuation.

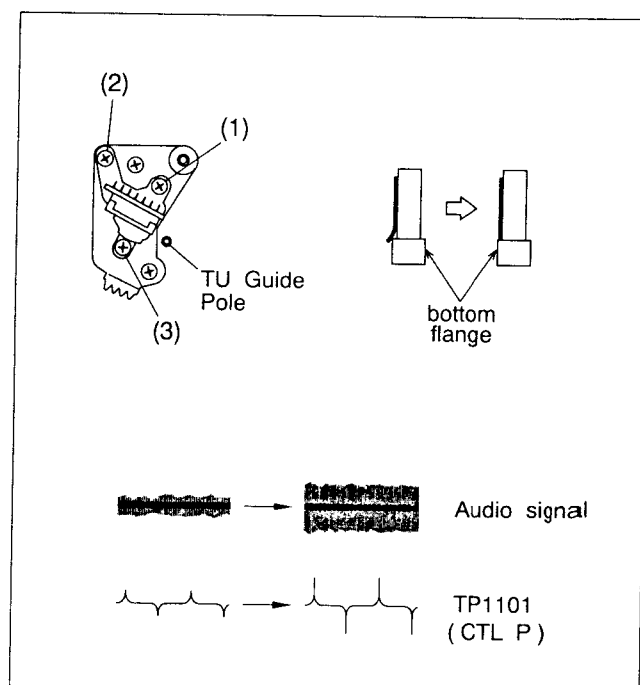


Fig. 2-7-5

2.7.3 A/C head phase(X-value)

- (1) Connect the oscilloscope to TP106(PB FM) on the PRE/REC board. Use TP111(D.FF) on the PRE/REC board as a trigger.
- (2) Playback the SP stairstep portion of the alignment tape [MHPE].
- (3) Set the neutral manual tracking position by pressing the **///** button on the remote controller or TV PROG "-" and "+" buttons simultaneously.
- (4) If adjustment is required, slightly loosen screws (4) and (5). Set A/C head positioning tool on the A/C head adjusting boss as indicated in Fig. 2-7-6.
- (5) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level as shown in Fig. 2-7-7.
- (6) Tighten screw (5). Remove the tool and tighten screw (4).

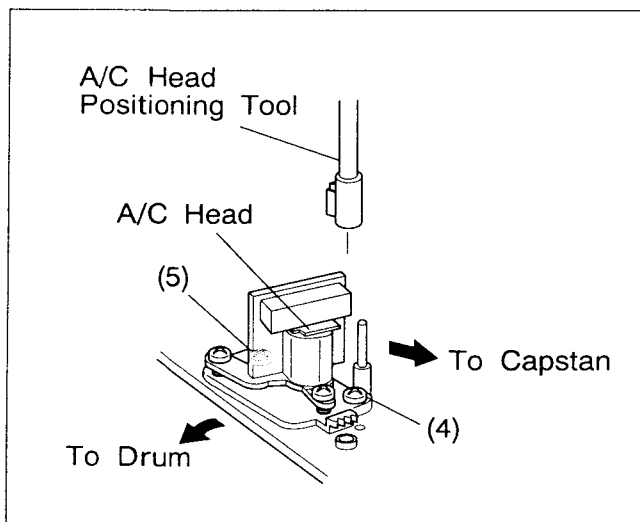


Fig. 2-7-6

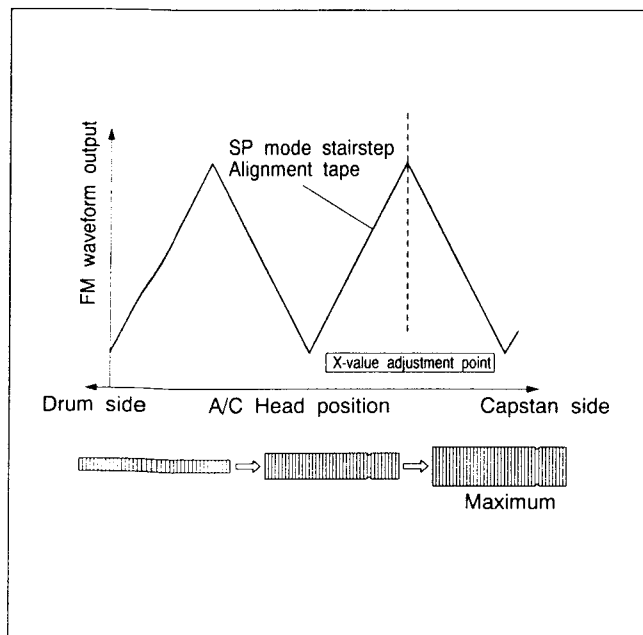


Fig. 2-7-7

2.7.4 Tension pole position

- (1) Set for playback mode using MECHANISM SERVICE MODE(See SECTION 1 DISASSEMBLY).
- (2) Slightly loosen the screw (A).
- (3) Turn the adjust pin so that the tension arm assembly does not touch $\phi 2.5$ pole on the outside.
- (4) Tighten the screw (A).
- (5) After adjustment, use the back tension cassette gauge and set for the playback mode.
- (6) Confirm reading of 29 to 46 g•cm.

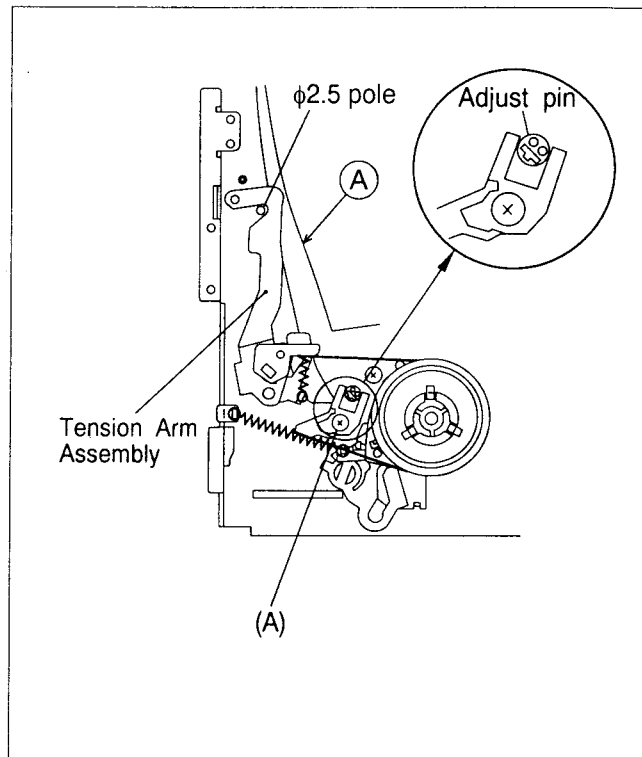


Fig. 2-7-8

2.7.5 Take-up torque

- (1) Use the back tension cassette gauge and set for the playback mode.
- (2) Confirm reading of 60 to 100 g•cm.

SECTION 3 ELECTRICAL ADJUSTMENT

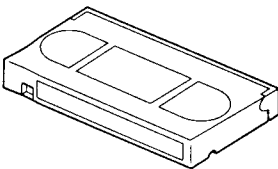
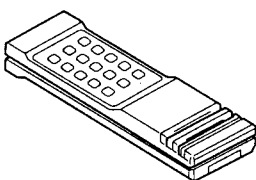
3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is available.

3.1.1 Required test equipment

- ① Colour television or monitor
- ② Oscilloscope: wide-band,dual-trace,triggered delayed sweep
- ③ Frequency counter
- ④ Digital voltmeter
- ⑤ Signal generator: RF/IF sweep/marker
- ⑥ Signal generator: PAL colour bar, staircase
- ⑦ Recording tape
- ⑧ Numeric-key remote controller(provided)

3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHPE	Presetting unit PTU940008
	

3.1.3 Colour bar signal,colour bar pattern

● Colour bar signal

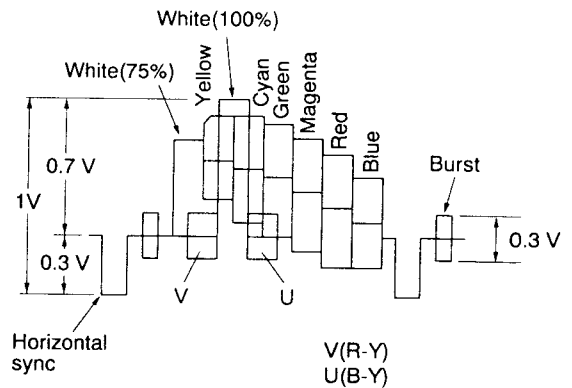


Fig.3-1-1 Colour bar signal waveform

● Colour bar pattern

White	Yellow	Cyan	Green	Magenta	Red	Blue
(75%)						
V	U	White 100%		Black		

Fig.3-1-2 Colour bar pattern

3.2 SERVO CIRCUIT

- Notes:**
- Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.
 - Set VCR to the mode A by remote controller.
 - Use only buttons "O", depressing other buttons during adjustment may cause adjustment errors.

3.2.1 PB switching point

Signal	• Alignment tape [MHPE], Stairstep
Mode	• PB
Equipment	• Oscilloscope
Measurement point	• J1411- pin 19 (VIDEO OUT) [TERMINAL BOARD]
Trigger slope (-)	• TP111(DRUM FF), [PRE/REC BOARD]
Adjustment tool	• Presetting unit [PTU94008]
Specification	• $6.5 \pm 0.5H$

- (1) Connect an oscilloscope to J1411- pin 19 (VIDEO OUT) and external trigger from TP111 (negative slope).
- (2) Playback the stairstep signal of the alignment tape.
- (3) Press the "O" button of the presetting unit.
- (4) Confirm that VCR mode becomes STOP mode.

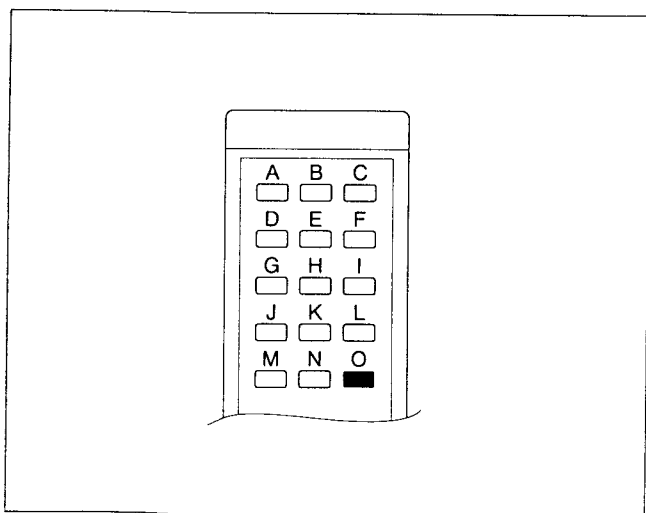


Fig.3-2-1 Presetting unit

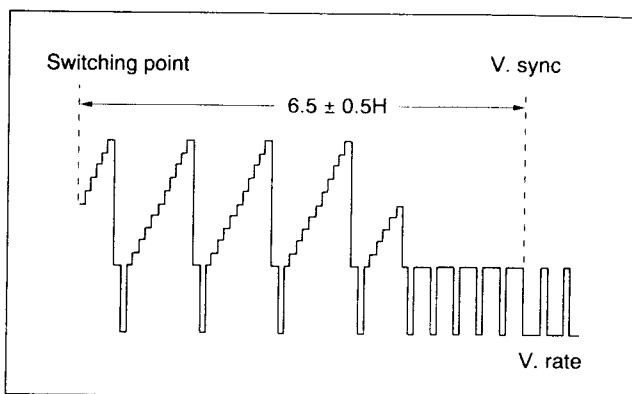


Fig.3-2-2 PB switching point

3.2.2 Slow tracking preset

Signal	• Tuner or colour bar
Mode	• SP, REC → PB(SLOW)
Equipment	• TV-Monitor
Adjustment tool	• Presetting unit [PTU94008]
Specification	• Minimum noise

Note : Set VCR to the mode A by remote controller.
Use only buttons "B" and "C", depressing other buttons during adjustment may cause adjustment errors.

- (1) Record a colour bar signal in the SP mode.
- (2) Playback recorded signal on the FWD slow mode.
- (3) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing "B" or "C" buttons of the presetting unit.
- (4) Depress the STOP button.
- (5) Confirm that the bar noise is not visible on the TV monitor in the slow mode.

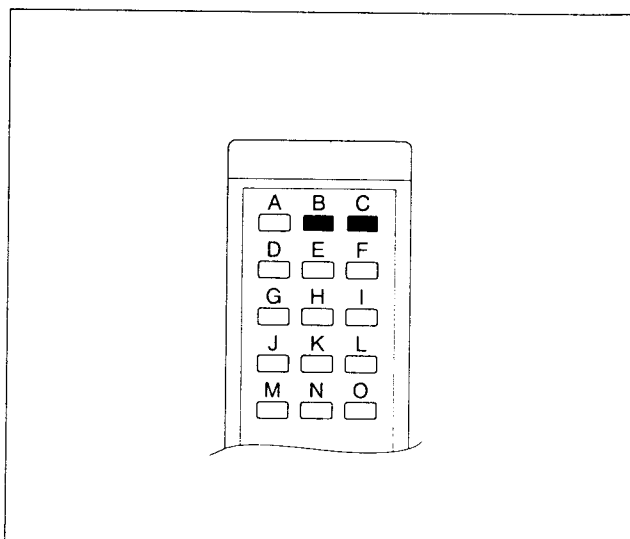


Fig.3-2-3 Presetting unit

3.3 VIDEO CIRCUIT

- Notes:**
- Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.
 - Set VCR to the mode A by remote controller.

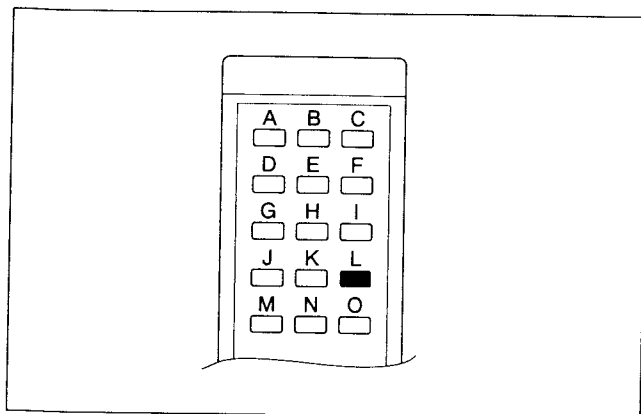


Fig.3-3-1 Presetting unit

3.3.1 Auto picture

Signal	• Monoscope
Mode	• REC then PB • SP
Adjustment tool	• Presetting unit[PTU94008]
Specification	• STOP mode

- (1) Record a monoscope signal in the SP mode.
- (2) Playback the recorded signal.
- (3) Press the "L" button of the presetting unit during playback.
- (4) Confirm that VCR will go into the STOP mode.

3.4 SYSCON CIRCUIT

- Notes:**
- Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.
 - When perform this adjustment, remove the MECHANISM assembly.

3.4.1 Timer clock

Signal	• No signal
Mode	• EE
Equipment	• Frequency counter
Measurement point	• TP702 round(SYS.CLK)
Adjustment part	• C701 (TIMER CLOCK)
Specification	• 1024.008 ± 0.001 Hz • $[976.5549 \pm 0.0010 \text{ usec}]$

- (1) Connect the frequency counter to TP702 round and GND.
- (2) Connect the short wire between TP701 round and Vcc(5V).
- (3) Short the leads of capacitor C704 once in order to reset IC701.
- (4) Disconnect the short wire then connect it again quickly.
- (5) Adjust C701 for 1024.008 ± 0.001 Hz.
($976.5549 \pm 0.0010 \text{ usec}$)

3.5 TUNER CIRCUIT

- Note:** Unless otherwise specified, all measurement points and adjustment parts are located on the IF UNIT.

3.5.1 RF AGC

Signal	• TV broadcasting
Mode	• Tuner
Equipment	• TV monitor
Measurement point	• IF UNIT
Adjustment part	• IF VR
Specification	• Minimum noise

- Note:** Adjust IF VR (RF AGC) to correct for excess noise in the picture or when streaks cross interference occurs due to strong electrical fields.

- (1) Adjust IF VR to minimize noise or streaks on the TV screen.
- (2) Adjust for noisy picture with strong signal. Then adjust until noise just disappears. Select other channels to confirm proper pick-up of channels.

SECTION 4 CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions

The Components Identified by the symbol  are critical for safety. For continued safety, replace safety critical components only with manufactures recommended parts.

1. Units of components on the schematic diagram

Unless otherwise specified.

- 1) All resistance values are in ohm. 1/6 W, 1/8 W (refer to parts list).
Chip resistors are 1/16 W.
K: K Ω (1000 Ω), M: M Ω (1000K Ω)
- 2) All capacitance values are in μ F, (P: PF).
- 3) All inductance values are in μ H, (m: mH).
- 4) All diodes are 1SS133, MA165 or IN4148M (refer to parts list).

2. Indications of control voltage

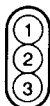
AUX : Active only at high.

AUX or AUX(L) : Active at low.

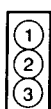
3. Interpreting Connector indications



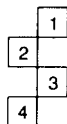
Removable connector



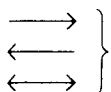
Wire soldered directly on board



Non-removable Board connector



Board to Board



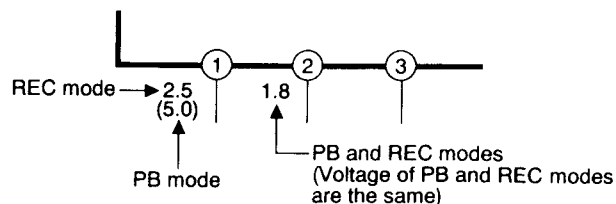
Connected pattern on board

4. Voltage measurement

- 1) Video circuits
REC : Colour bar signal in SP mode, normal VHS mode.
PB : Alignment tape, colour bar SP mode, normal VHS mode.
— : Unmeasurable or unnecessary to measure.
- 2) Audio circuits
REC : 1KHz, -8 dBs sine wave signal in SP mode, Normal VHS mode.
PB : REC then playback it.
- 3) Movie Camera circuits
Measured using a correctly illuminated grey scale or colour bar test charts in the E-E mode.

4) Indication on schematic diagram

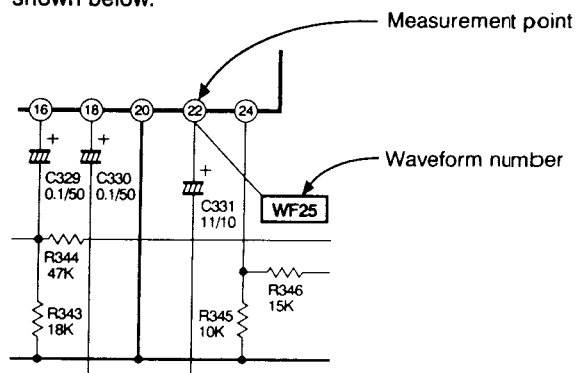
Voltage Indications for REC and PB mode on the schematic diagram are as shown below.



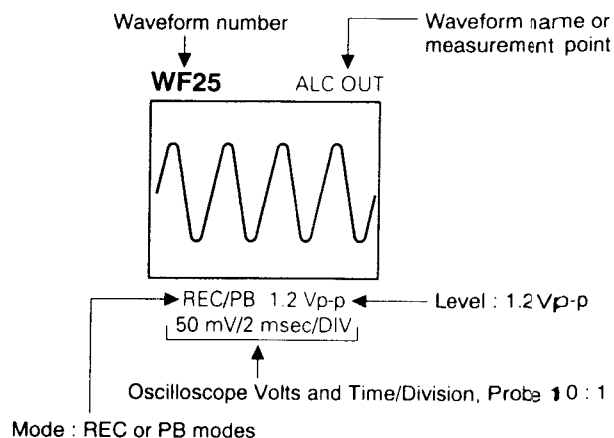
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

- 1) Video circuits
REC : Colour bar signal in SP mode, normal VHS mode.
PB : Alignment tape, colour bar SP mode, normal VHS mode.
- 2) Audio circuits
REC : 1KHz, -8 dBs sine wave signal in SP mode, normal VHS mode.
PB : REC then playback it.
- 3) Movie Camera circuits
Measured using a correctly illuminated grey scale or colour bar test charts in the E-E mode.
- 4) Indication on schematic diagram
Waveform indications on the schematic diagram are as shown below.



5) Waveform indications



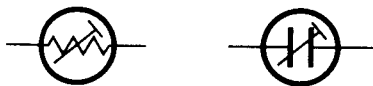
6. Signal path Symbols

The arrows indicate the signal path as follows.

	Playback signal path
	Playback and recording signal path
	Recording signal path (including E-E signal path)
	Y signal path
	Colour (Chroma) signal path
	R or R-Y signal path
	B or B-Y signal path
	Capstan servo path
	Drum servo path
	Reel servo path

7. Indication of the parts for adjustments

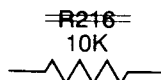
The parts for the adjustments are surrounded with the circle as shown below.



8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.

Or the symbol number is struck off by two lines as below.



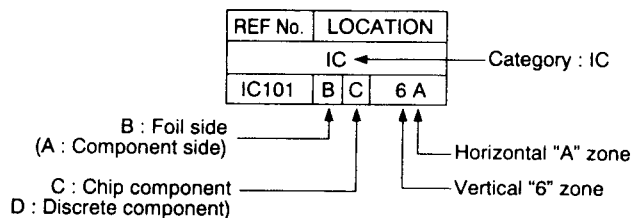
CIRCUIT BOARD NOTES

1. Foil and Component sides

- 1) Foil side (B side) :
Parts on the foil side seen from foil face (pattern face) are indicated.
- 2) Component side (A side) :
Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

Parts location are indicated by guide scale on the circuit board.



Notes:

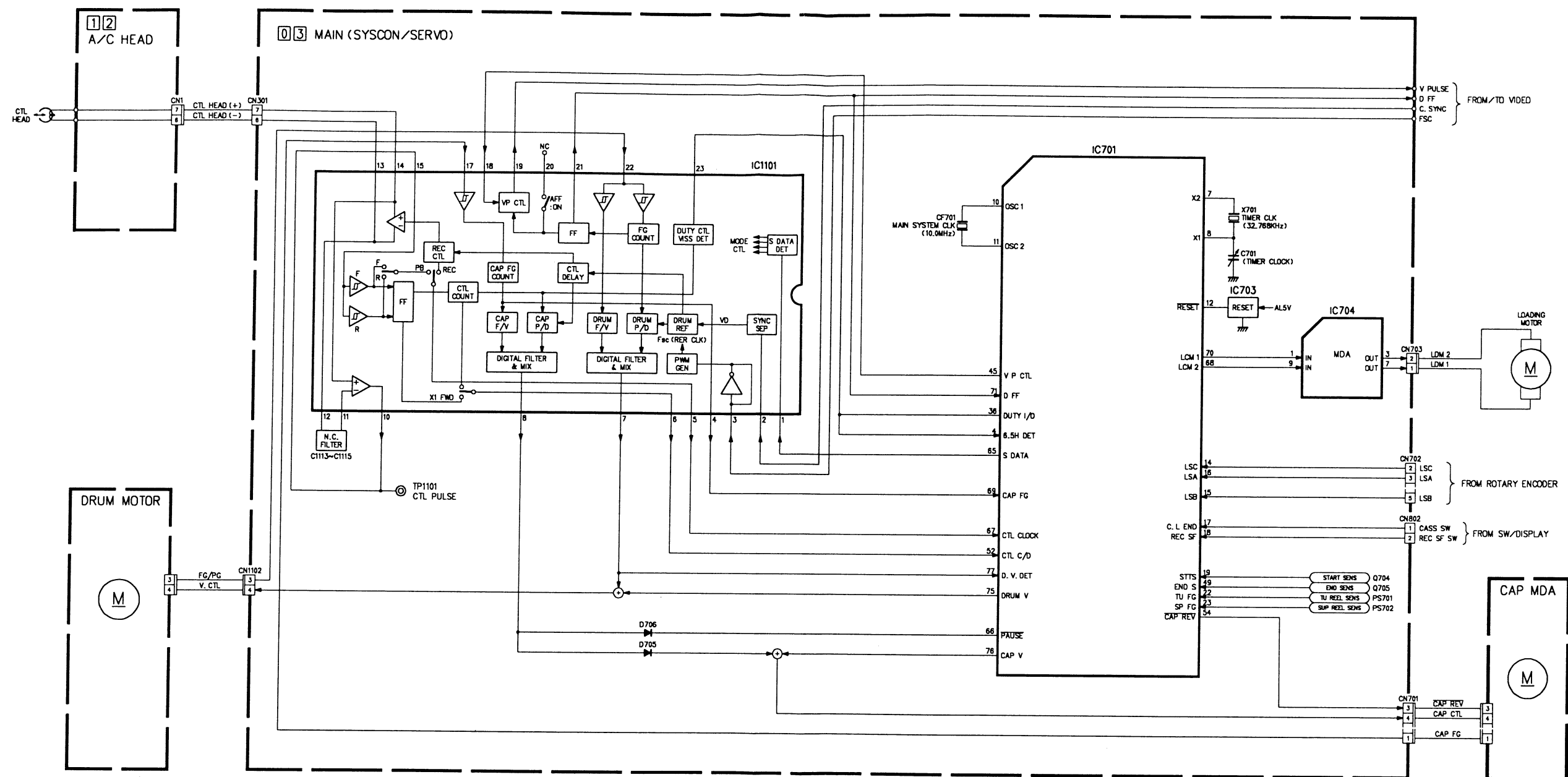
- 1) For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).
- 2) For repairing SMC (Surface Mounted Components), please refer to the VIDEO SERVICE GUIDE No. VTS81001.

A vertical axis with tick marks and labels 1, 2, 3, 4, 5 from bottom to top.

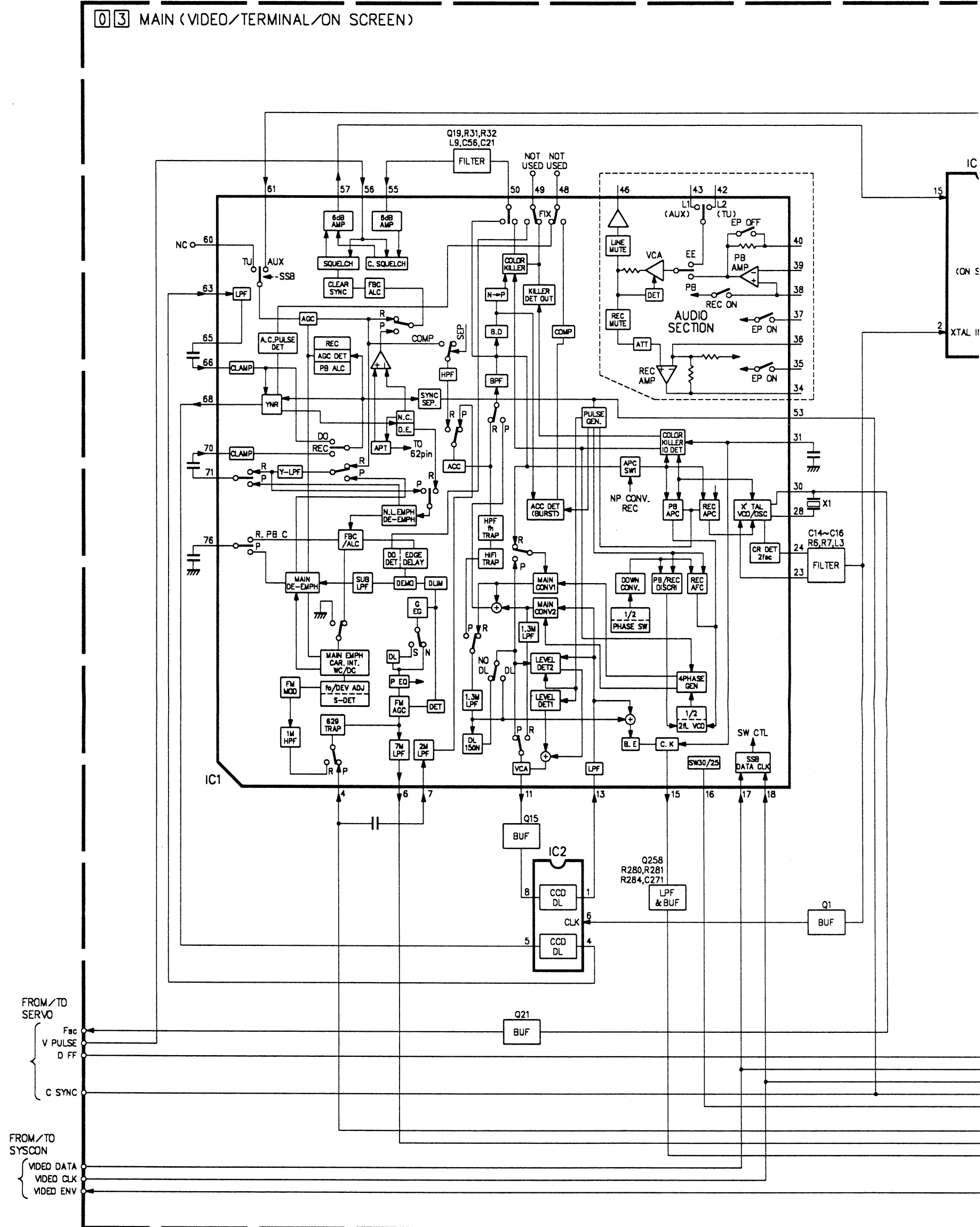


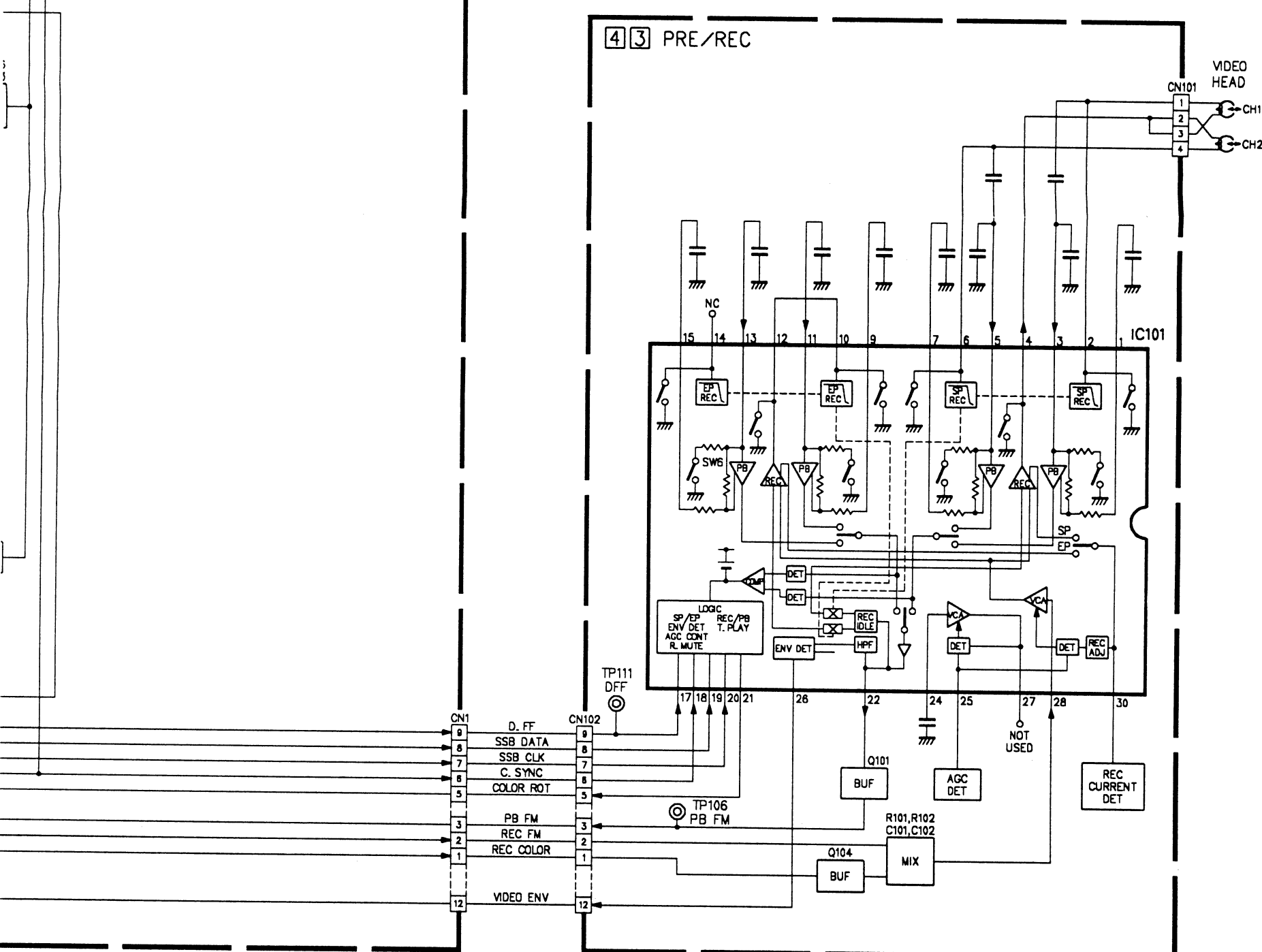
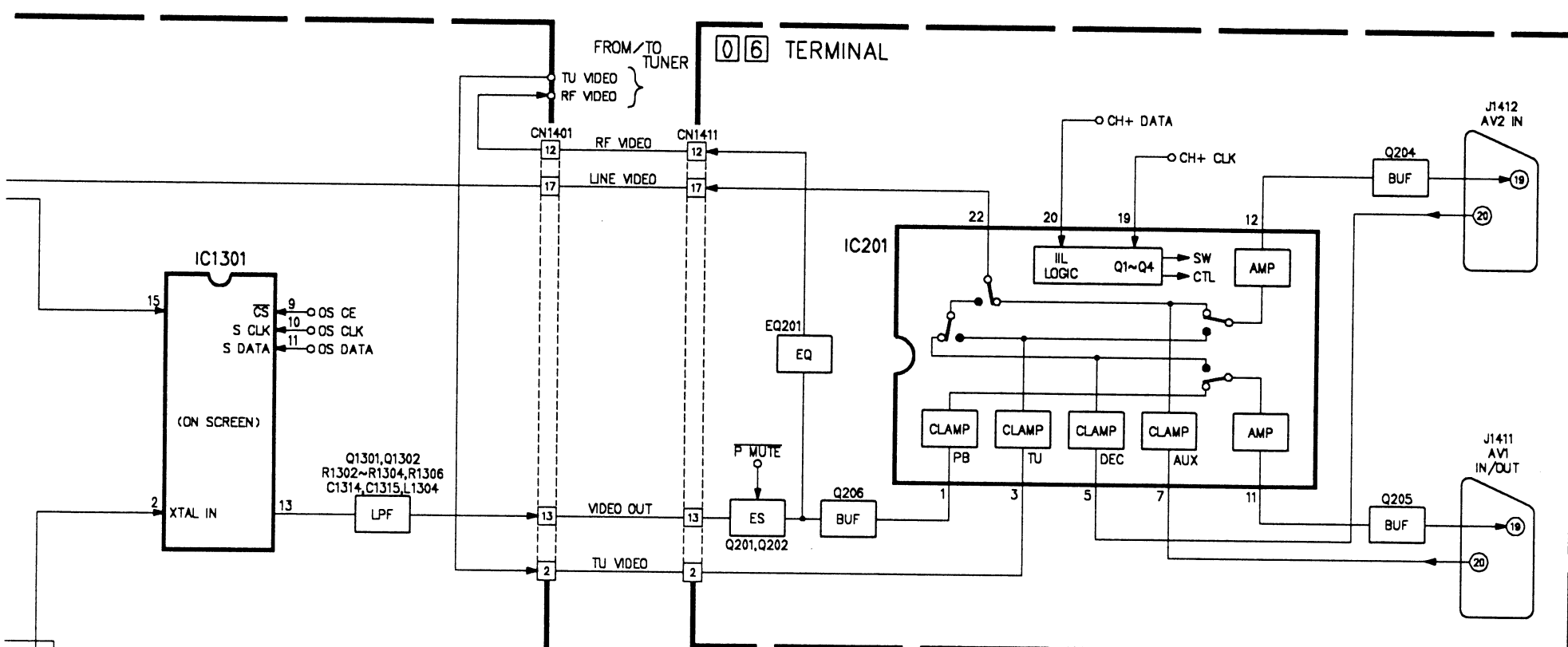
1

4.2 SYSTEM CONTROL BLOCK DIAGRAM



4.3 VIDEO BLOCK DIAGRAM





5



3

2

1

A

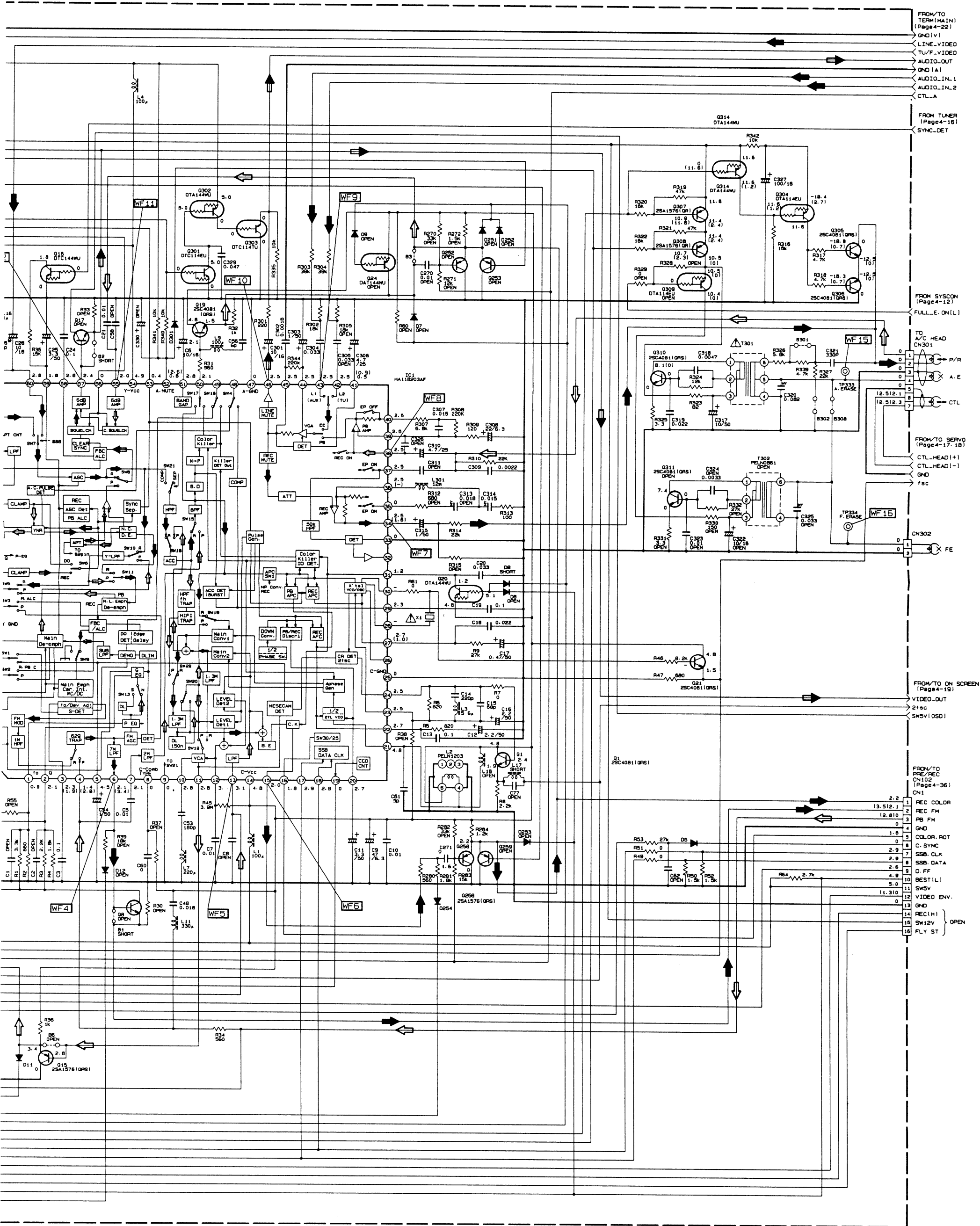
B

C

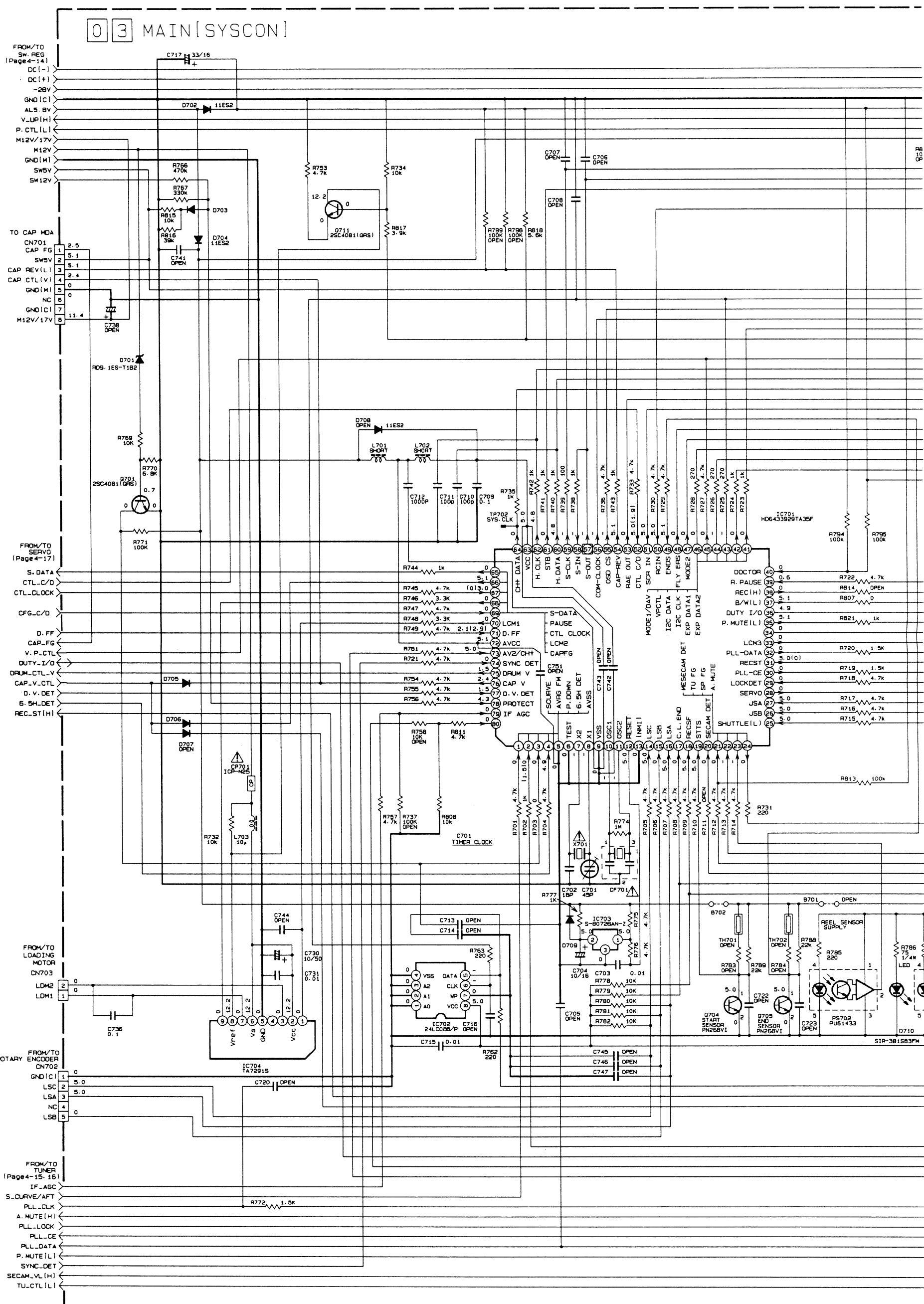
D

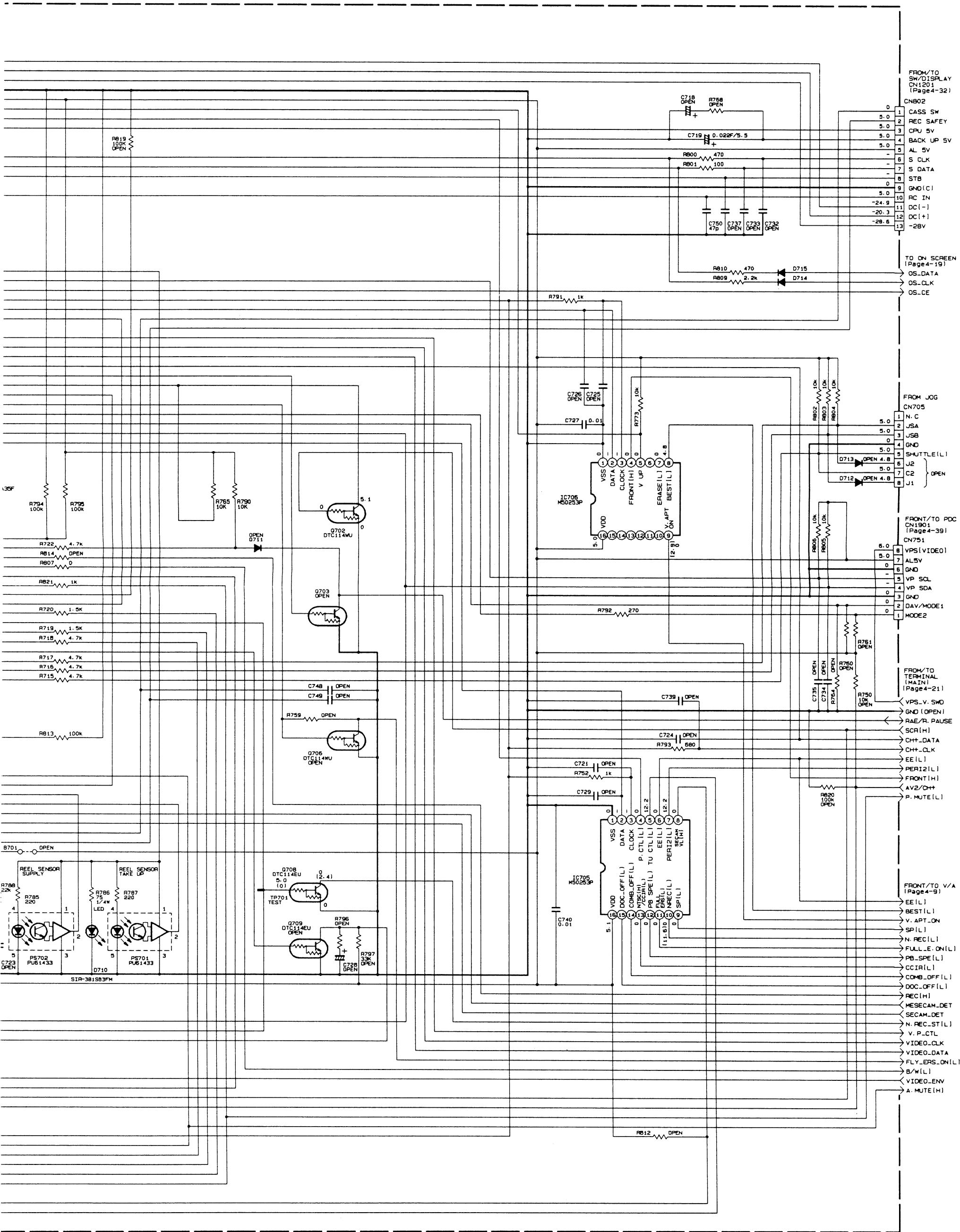
4-9

4-1

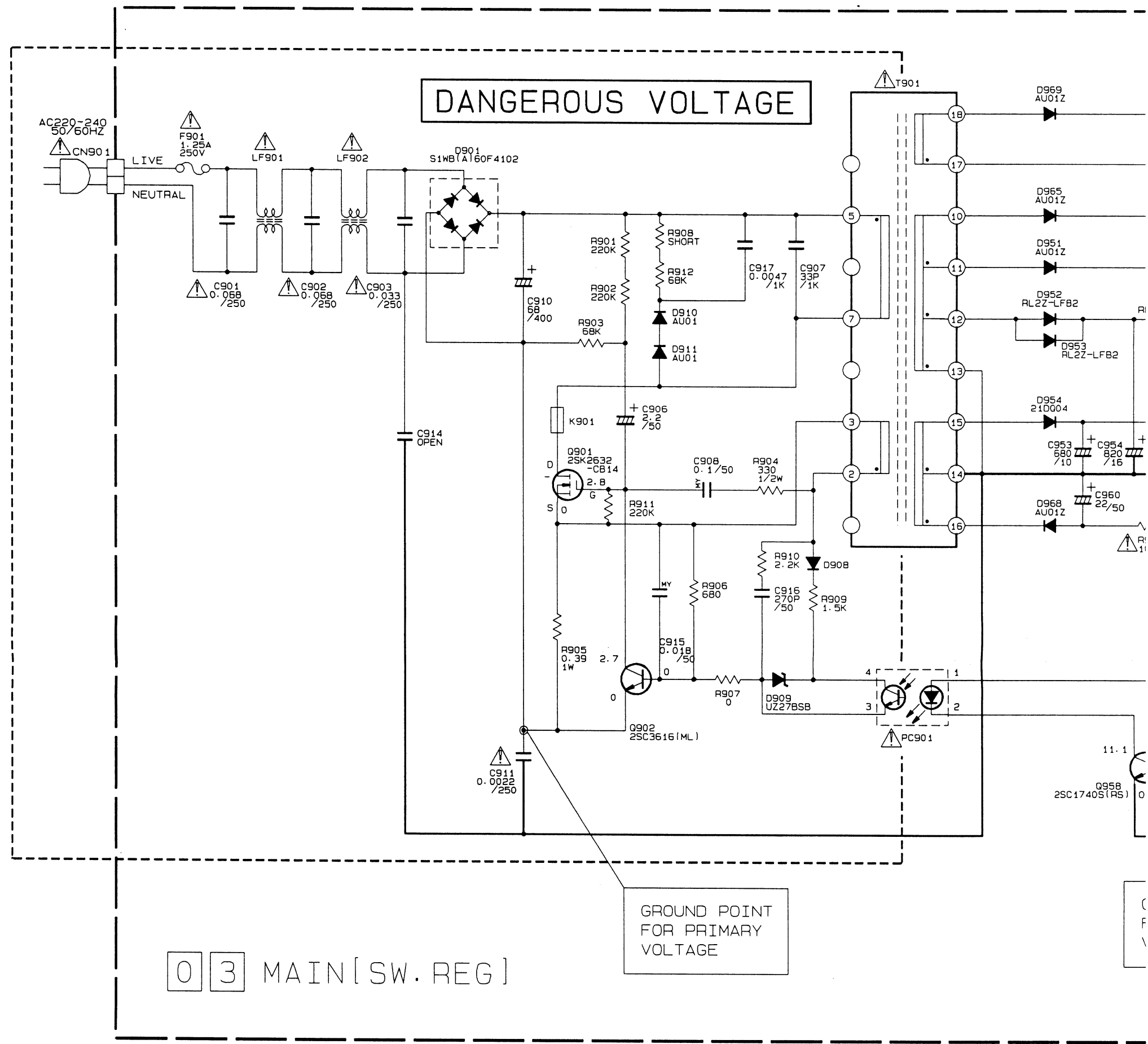


4.5 SYSTEM CONTROL SCHEMATIC DIAGRAM





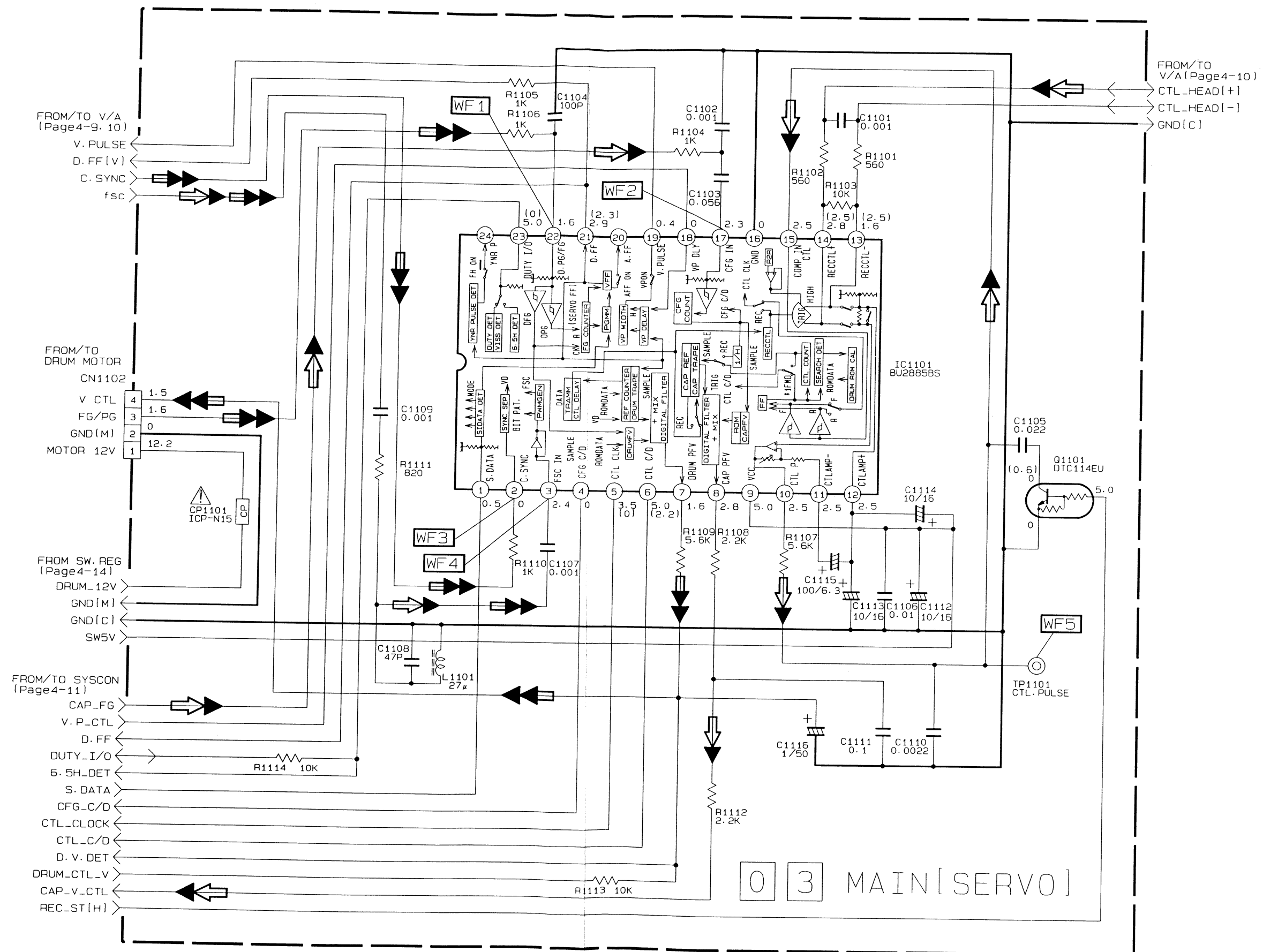
4.6 SWITCHING REGULATOR SCHEMATIC DIAGRAM



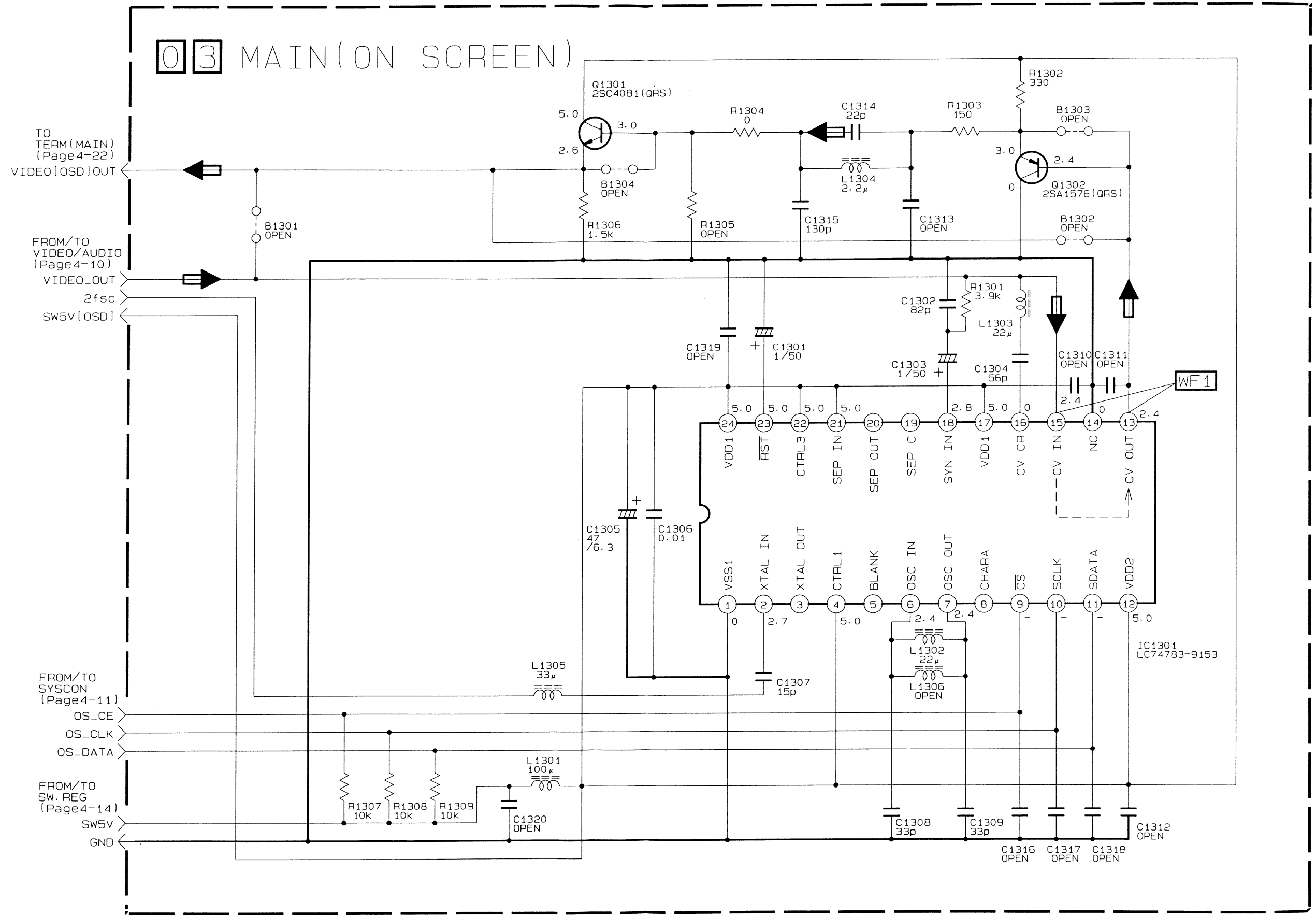
A vertical scale with five horizontal tick marks. The numbers 1, 2, 3, 4, and 5 are placed to the left of the tick marks, increasing from bottom to top.



4.8 SERVO SCHEMATIC DIAGRAM

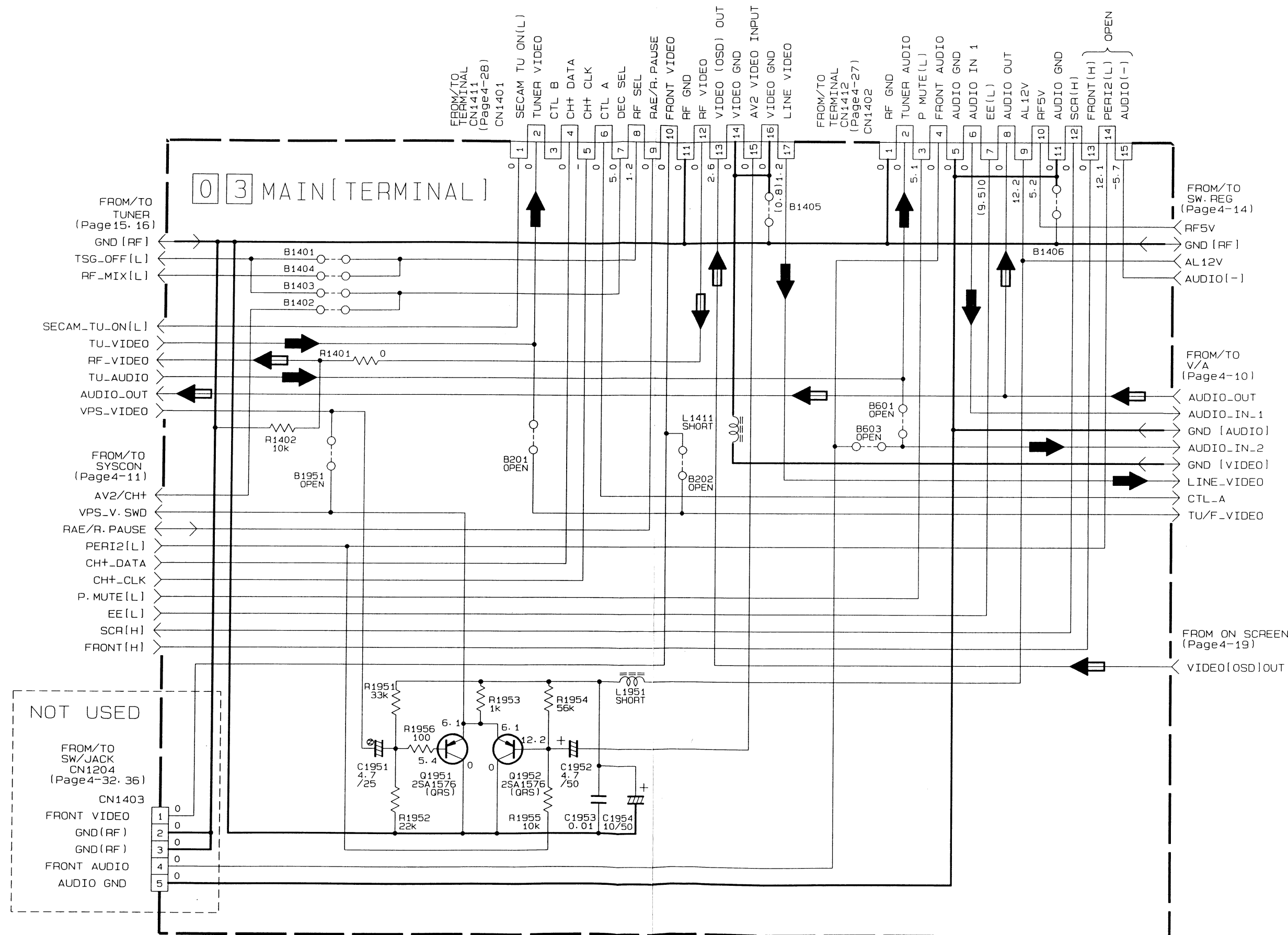


4.9 ON SCREEN SCHEMATIC DIAGRAM



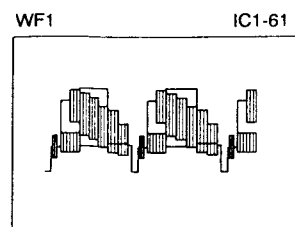
NOTE : For ON SCREEN waveforms, please refer to page4-23.

4.10 TERMINAL (MAIN) SCHEMATIC DIAGRAM

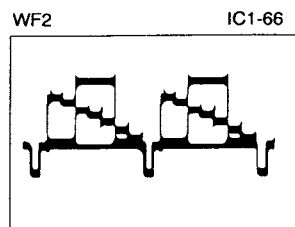


WAVEFORMS

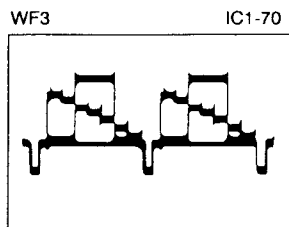
— VIDEO / N.AUDIO —



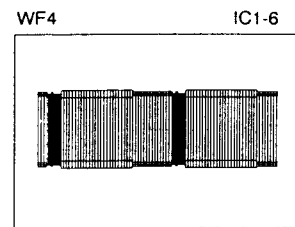
REC 0.74Vp-p
20mV/20 μ sec /DIV



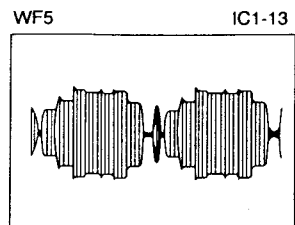
PB 0.52Vp-p
20mV/5 μ sec /DIV



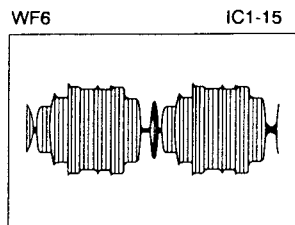
REC/PB 0.54Vp-p
20mV/20 μ sec /DIV



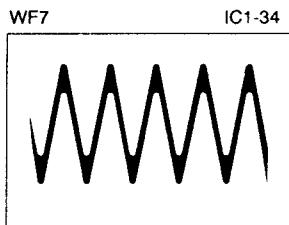
REC 0.4Vp-p
20mV/5msec/DIV



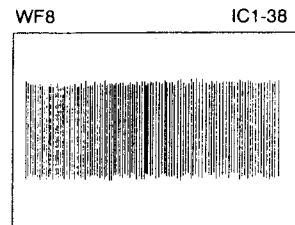
PB 0.6Vp-p
20mV/20 μ sec/DIV



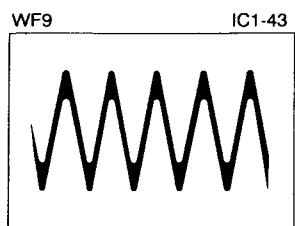
REC 0.4Vp-p
20mV/20 μ sec/DIV



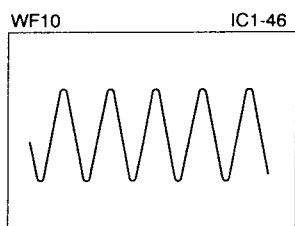
REC 1.7Vp-p
50mV/1msec/DIV



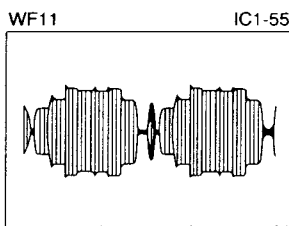
PB 0.01Vp-p
0.5mV/5msec/DIV



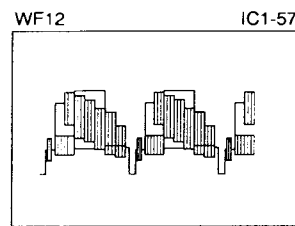
REC 0.22Vp-p
10mV/1msec/DIV



REC/PB 1.2Vp-p
50mV/1msec/DIV



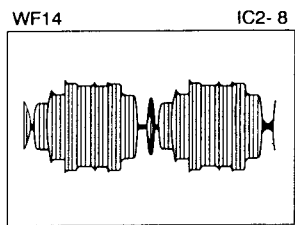
PB 0.6Vp-p
20mV/20 μ sec/DIV



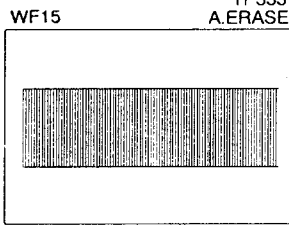
REC/PB 2.5Vp-p
0.1V/20 μ sec/DIV



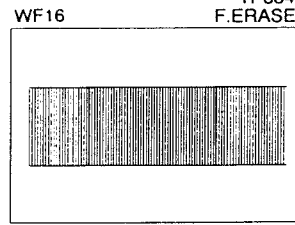
PB 0.48Vp-p
20mV/20 μ sec/DIV



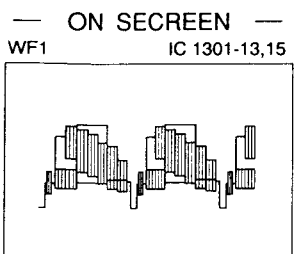
PB 0.4Vp-p
20mV/20 μ sec/DIV



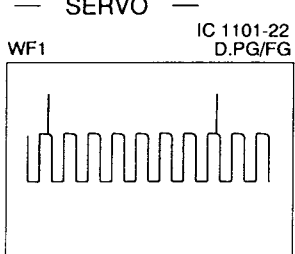
REC 33.0Vp-p
1V/1msec/DIV



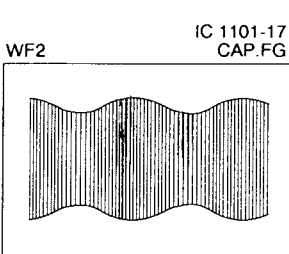
REC 33.0Vp-p
1V/1msec/DIV



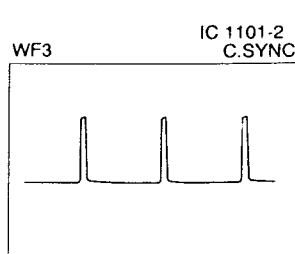
REC/PB 2.1Vp-p
0.1V/20 μ sec/DIV



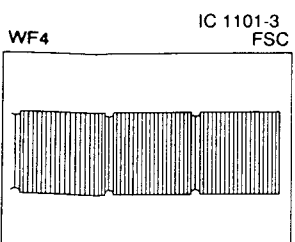
REC/PB 4.0Vp-p
0.1V/5msec/DIV



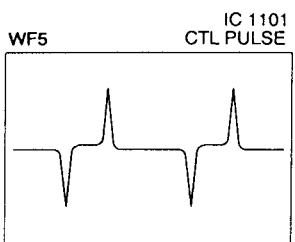
REC/PB 3.4Vp-p
0.1V/10msec/DIV



REC 5.0Vp-p
0.2V/20 μ sec/DIV



REC/PB 0.5Vp-p
20mV/5msec/DIV

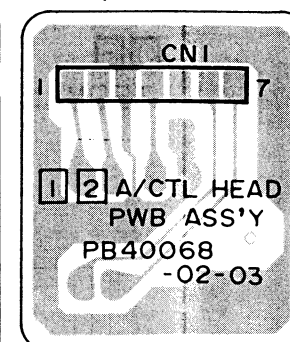


PB 3.0Vp-p
0.1V/10msec/DIV

COMPONENT PARTS LOCATION GUIDE

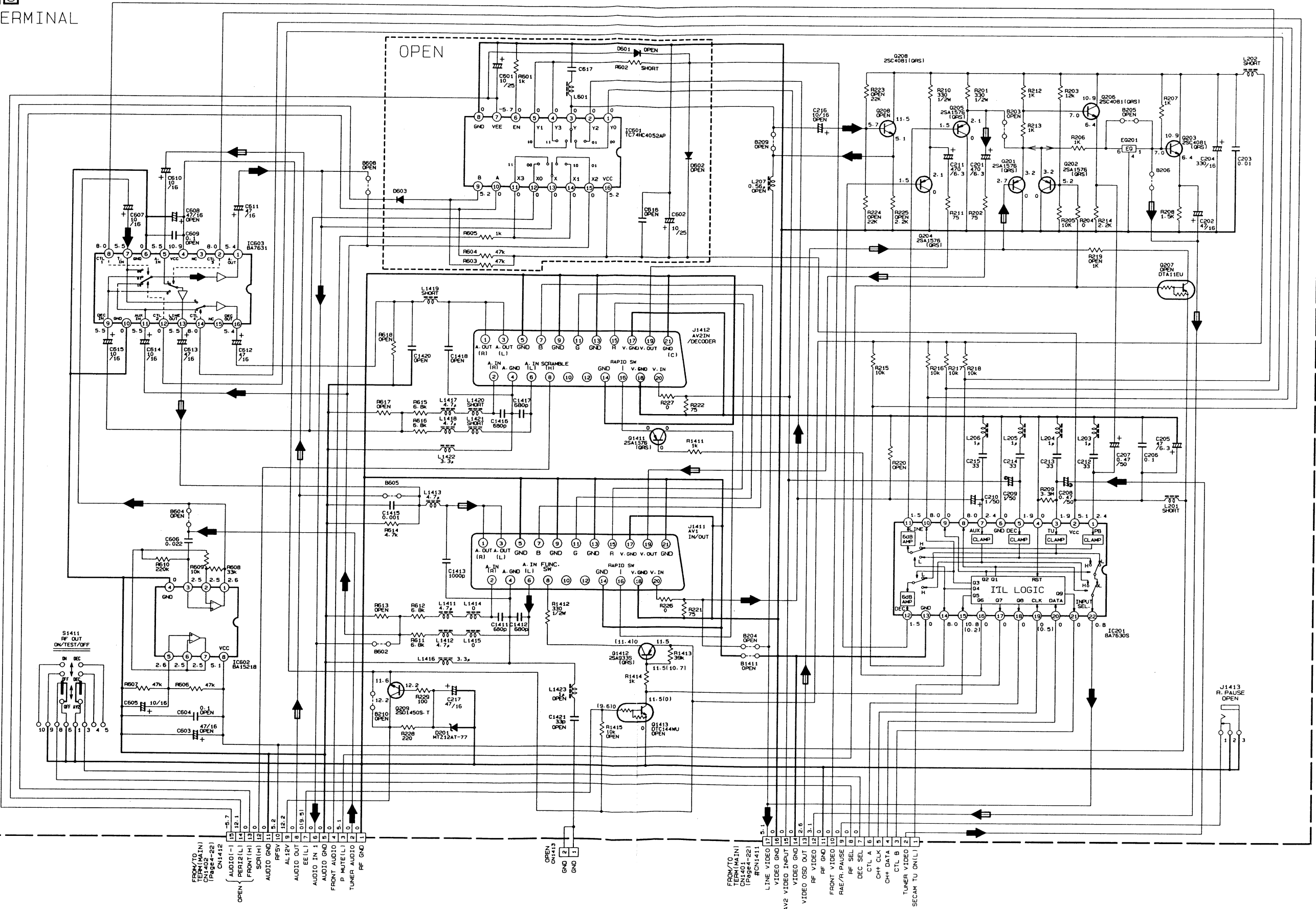
REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION
CAPACITOR																	
C1	B C 7F	C318	B C 7M	C1107	B C 9L	IC252	A D 21B	Q960	A D 11M	R310	B C 8J	R792	B C 17F	R1305	B C 170		
C2	B C 7F	C319	B C 7M	C1108	B C 10L	IC701	B C 15E	Q1002	A D 19M	R312	B C 8J	R793	B C 17L	R1306	B C 160		
C3	B C 7G	C320	B C 7L	C1109	B C 10L	IC702	A D 18H	Q1003	A D 19N	R313	B C 8J	R794	B C 17E	R1307	B C 15L		
C4	B C 8G	C321	B C 8M	C1110	B C 9M	IC703	A D 14D	Q1004	B C 21N	R314	B C 9J	R795	A D 18E	R1308	B C 15L		
C5	B C 8G	C322	B C 8M	C1111	B C 9L	IC704	A D 6N	Q1005	B C 22N	R315	B C 9J	R796	B C 18C	R1309	B C 15M		
C6	A D 8J	C323	B C 8N	C1112	A D 9L	IC705	A D 16I	Q1006	B C 21O	R316	B C 7N	R797	B C 17D	R1401	B C 180		
C7	B C 9G	C324	B C 8N	C1113	A D 9K	IC706	A D 16J	Q1007	B C 21M	R317	B C 7M	R798	B C 17G	R1402	B C 19P		
C8	B C 9G	C325	A D 8M	C1114	A D 9L	IC1001	A D 22K	Q1008	B C 21M	R318	B C 7M	R799	B C 17G	R1951	B C 130		
C9	A D 10F	C326	B C 8J	C1115	A D 9L	IC1101	A D 10L	Q1009	B C 22J	R319	B C 7M	R800	B C 2B	R1952	B C 140		
C10	B C 9H	C327	A D 7M	C1116	A D 10K	IC1301	A D 17M	Q1010	B C 20N	R320	B C 7M	R801	B C 2B	R1953	B C 14P		
C11	A D 10H	C328	B C 8K	C1301	A D 17N	COIL											
C12	A D 10H	C330	A D 7O	C1302	B C 17N	L1	A D 10D	Q1011	B C 19O	R322	B C 7M	R802	B C 2C	R1954	B C 140		
C13	B C 8H	C701	A D 14D	C1303	A D 17N	L2	A D 9H	Q1012	B C 19O	R323	B C 7M	R803	B C 3C	R1955	B C 130		
C14	B C 10I	C702	B C 14E	C1304	B C 17N	L3	A D 9I	Q1013	B C 19N	R324	B C 7M	R804	B C 21C	TEST POINT			
C15	B C 9I	C703	B C 14E	C1305	A D 16N	L4	A D 6I	Q1014	B C 19N	R325	B C 7M	R805	TP254	A D 20C			
C16	A D 10I	C704	B C 14D	C1306	B C 16N	L5	A D 6I	Q1101	B C 10N	R326	B C 7M	R806	TP255	A D 21C			
C17	A D 9I	C705	B C 17C	C1307	A D 15N	L6	A D 7F	Q1301	B C 17O	R327	B C 7L	R807	TP333	A D 7L			
C18	B C 9I	C706	B C 16G	C1308	B C 17M	L7	A D 10D	Q1302	B C 16N	R328	B C 8N	R808	TP334	A D 9N			
C19	B C 8H	C707	B C 16G	C1309	B C 17M	L8	A D 7E	Q1951	B C 14P	R329	B C 8N	R809	TP701	A D 17C			
C20	B C 8I	C708	B C 18E	C1310	B C 16N	L9	A D 7I	Q1952	B C 14P	R330	B C 9N	R810	TP702	A D 16H			
C21	B C 6I	C709	B C 16G	C1311	B C 16N	L10	A D 6G	RESISTOR									
C22	B C 6I	C710	B C 16G	C1312	B C 16M	L11	A D 10F	R1	B C 8F	R332	B C 8M	R811	TP901	A D 2C			
C23	A D 6I	C711	B C 16G	C1313	B C 17N	L12	A D 10F	R2	B C 7F	R333	B C 8M	R812	TPGND	A D 1C			
C24	B C 6H	C712	B C 15G	C1314	B C 17O	L13	A D 10F	R3	B C 8F	R334	B C 7L	R813	OTHERS				
C25	A D 6H	C713	B C 14E	C1315	B C 17N	L14	A D 10H	R4	B C 7F	R335	B C 6I	R814	CF701	A D 15D			
C26	B C 6H	C714	B C 19H	C1316	B C 17M	L15	A D 9H	R5	B C 9H	R336	B C 6E	R815	FL254	A D 8E			
C27	B C 6H	C715	B C 19H	C1317	B C 16M	L16	A D 9H	R6	B C 9H	R337	B C 7N	R816	IF-UNIT	A D 21K			
C28	B C 6H	C716	B C 19H	C1318	B C 16M	L17	A D 20D	R7	B C 9H	R338	B C 7J	R817	K901	A D 2P			
C29	A D 6G	C717	A D 4B	C1319	B C 17M	L18	A D 21E	R8	B C 9H	R339	B C 13E	R818	LP901	A D 2P			
C30	B C 6G	C718	A D 2C	C1320	B C 15M	L19	A D 20B	R9	B C 9H	R340	B C 14E	R819	LP902	A D 40			
C31	A D 6G	C719	A D 1B	C1451	B C 4N	L20	A D 21A	R10	B C 6G	R341	B C 13E	R820	PC901	A D 5L			
C32	A D 6G	C720	B C 17L	C1951	A D 13O	L21	A D 8K	R11	B C 6F	R342	B C 14C	R821	PS701	A D 9B			
C33	B C 6F	C721	B C 16I	C1952	A D 14O	L22	A D 15G	R12	B C 7F	R343	B C 14C	R822	PS702	A D 15B			
C34	B C 7G	C722	B C 4E	C1953	B C 13O	L23	A D 16G	R13	B C 6F	R344	B C 14C	R823	T301	A D 7M			
C35	B C 7G	C723	B C 18D	C1954	A D 13O	L24	A D 7O	R14	B C 7G	R345	B C 15C	R824	T302	A D 8N			
C36	B C 7G	C724	B C 15H	CONNECTOR													
C37	B C 7G	C725	B C 15J	CN1	A D 12L	L25	A D 2G	R15	B C 7F	R346	B C 15C	R825	T901	A D 1K			
C38	B C 7F	C726	B C 15J	CN301	A D 7L	L26	A D 3G	R16	B C 7F	R347	B C 15C	R826	T1001	A D 22N			
C39	B C 7G	C727	B C 16J	CN302	A D 9M	L27	A D 3G	R17	B C 8F	R348	B C 16C	R827	T1002	A D 21O			
C40	B C 7G	C728	B C 18D	CN701	A D 10J	L28	A D 2D	R18	B C 7I	R349	B C 15D	R828	TH701	A D 40			
C41	B C 8D	C729	A D 16I	CN702	A D 6B	L29	A D 20K	R19	B C 7I	R350	B C 15D	R829	TH702	A D 18D			
C42	B C 8D	C730	A D 7N	CN703	A D 6L	L30	A D 21K	R20	B C 10F	R351	B C 15D	R830	TU1001	A D 20P			
C43	A D 10D	C731	B C 6N	CN705	A D 3B	L31	A D 20P	R21	B C 10F	R352	B C 16D	R831	WR1	A D 14I			
C44	B C 8D	C732	B C 1B	CN751	A D 21D	L32	A D 16M	R22	B C 10F	R353	B C 16D	R832	X1	A D 8I			
C45	B C 6F	C733	B C 1B	CN802	A D 2A	L33	A D 17M	R23	B C 9H	R354	B C 16D	R833	X701	A D 14E			
C46	B C 6G	C734	B C 21D	CN901	A D 1O	L34	A D 17N	R24	B C 8G	R355	B C 16C	R834					
C47	B C 10F	C735	B C 21D	CN1102	A D 11M	L35	A D 17O	R25	B C 8G	R356	B C 16C	R835					
C48	B C 8G	C736	B C 3A	CN1401	A D 12P	L36	A D 15N	R26	B C 6D	R357	B C 16C	R836					
C49	A D 8F	C737	B C 3A	CN1402	A D 11P	L37	A D 17M	R27	B C 8G	R358	B C 17E	R837					
C50	A D 5G	C738	A D 10I	CN1403	A D 11P	L38	A D 15O	R28	B C 8H	R359	B C 17E	R838					
C51	B C 7J	C739	A D 17L	CN1451	A D 20P	L39	A D 4M	R29	B C 8H	R360	B C 17E	R839					
C52	B C 6I	C740	A D 16I	CIRCUIT PROTECTOR													
C53	B C 8G	C741	A D 4B	CP701	A D 6O	L40	A D 12O	R30	B C 13K	R361	B C 17E	R840					
C54	B C 8H	C742	A D 15E	CP901	A D 2F	L41	A D 13K	R31	B C 13K	R362	B C 17E	R841					
C55	B C 14L	C743	B C 16F	CP902	A D 3F	L42	A D 13L	R32	B C 13K	R363	B C 17F	R842					
C56	B C 8D	C744	B C 6N	CP903	A D 1E	L43	A D 14M	R33	B C 14M	R364	B C 17F	R843					
C57	B C 7D	C745	B C 6B	CP904	A D 3E	L44	A D 8F	R34	B C 8F	R365	B C 17F	R844					
C58	B C 8D	C746	B C 7B	CP1101	A D 11M	L45	A D 9F	R35	B C 8F	R366	B C 17F	R845					
C59	B C 10D	C747	B C 3A	DIODE													
C60	B C 7F	C748	B C 1B	D5	A D 13M	L46	A D 8D	R36	B C 8F	R367	B C 16D	R846					
C61	B C 5G	C749	B C 15E	D6	A D 10G	L47	A D 13N	R37	B C 8F	R368	B C 16D	R847					
C62	B C 9H	C901	A D 2P	D7	A D 8K	L48	A D 6D	R38	B C 9M	R369	B C 16D	R848					
C63	B C 5H	C902	A D 2N	D8	A D 10F	L49	A D 9J	R39	B C 8M	R370	B C 16D	R849					
C64	B C 20F	C903	A D 3L	D9	A D 12E	L50	A D 8F	R40	B C 8F	R371	B C 16D	R850					
C65	B C 20F	C904	A D 3K	D10	A D 11G	L51	A D 8F	R41	B C 8F	R372	B C 16D	R851					
C66	B C 20E	C905	A D 2K	D11	A D 8F	L52	A D 6K	R42	B C 8F	R373	B C 16D	R852					
C67	B C 20F	C906	A D 2M	D12	A D 6K	L53	A D 20E	R43	B C 7J	R374	B C 16D	R853					
C68	B C 20F	C907	A D 2M	D13	A D 10E	L54	A D 7J	R44	B C 7J	R375	B C 16D	R854					
C69	B C 20E	C908	A D 2M	D14	A D 9E	L55	A D 21G	R45	B C 7J	R376	B C 16D	R855					
C70	B C 20E	C909	A D 2M	D15	A D 7O	L56	A D 19B	R46	B C 7J	R377	B C 16D	R856					
C71	B C 20E	C910	A D 2K	D16	A D 11C	L57	A D 22E	R47	B C 7J	R378	B C 16D	R857					
C72	B C 21D	C911	A D 3K	D17	A D 4B	L58	A D 21F	R48	B C 7J	R379	B C 16D	R858					
C73	B C 20E	C912	A D 1H	D18	A D 12C	L59	A D 9F	R49	B C 7J	R380	B C 16D	R859					
C74	B C 21F	C913	A D 2H	D19	A D 4B	L60	A D 9E	R50	B C 7J	R381	B C 16D	R860					
C75	B C 21F	C914	A D 3H	D20	A D 14F	L61	A D 6E	R51	B C 7J	R382	B C 16D	R861					
C76	B C 21G	C915	A D 3G	D21	A D 15G	L62	A D 7E	R52	B C 7J	R383	B C 16D	R862					

DANGEROUS VOLTAGE

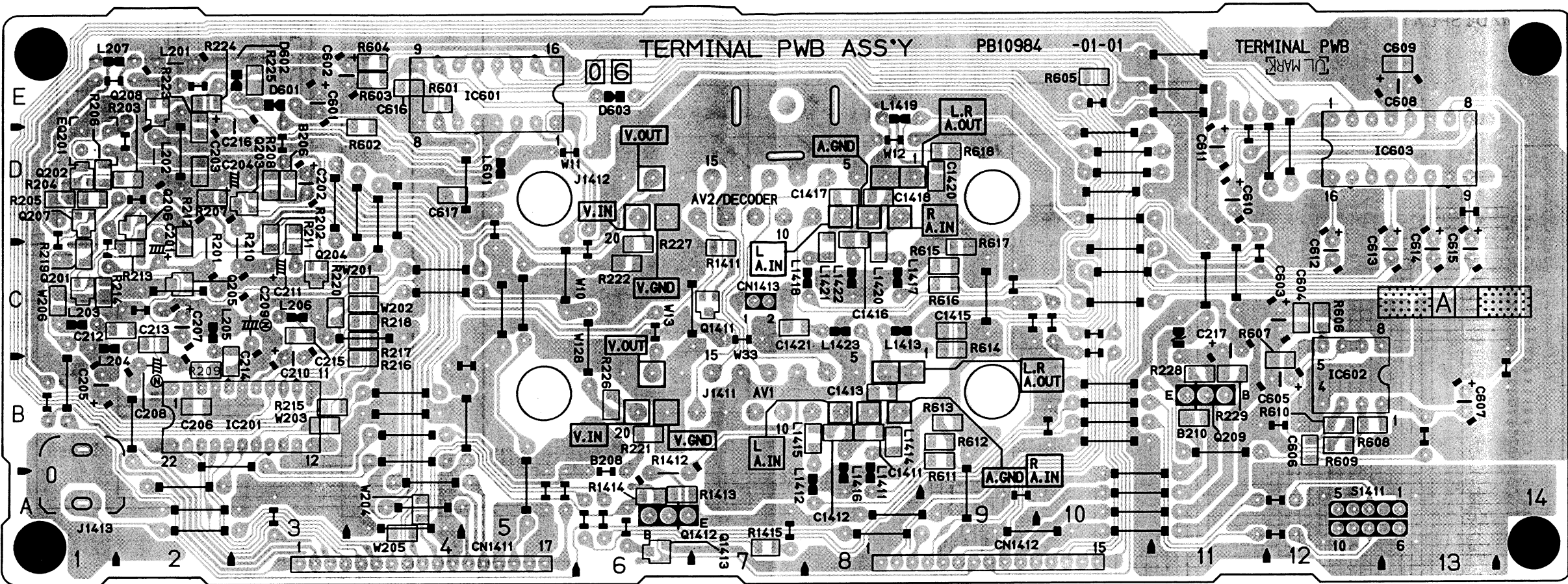


4.12 TERMINAL SCHEMATIC DIAGRAM

06
TERMINAL



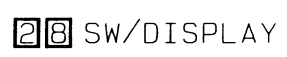
4.13 TERMINAL CIRCUIT BOARD



COMPONENT PARTS LOCATION GUIDE <TERMINAL PWB>

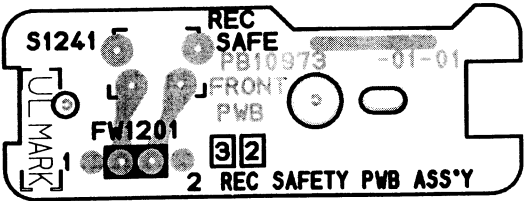
REF.No.	LOCATION	REF.No.	LOCATION	REF.No.	LOCATION	REF.No.	LOCATION
CAPACITOR		C1417	B C 8D	L1422	A D 8C	R225	B C 3E
C201	A D 2C	C1418	B C 8D	L1423	A D 8C	R226	B C 6B
C202	A D 3D	C1420	B C 9D	TRANSISTOR		R227	B C 6C
C203	B C 2D	C1421	B C 7C	Q201	B C 1C	R228	B C 11B
C204	A D 2D	CONNECTOR		Q202	B C 1D	R229	B C 11B
C205	A D 1B	CN1411	A D 3A	Q203	B C 3D	R601	B C 4E
C206	B C 2B	CN1412	A D 8A	Q204	B C 3C	R602	B C 4D
C207	A D 2C	CN1413	A D 7C	Q205	B C 2C	R603	B C 4E
C208	A D 2B	DIODE		Q206	B C 2D	R604	B C 4E
C209	A D 3C	D201	A D 11C	Q207	B C 1D	R605	B C 10E
C210	A D 3B	D601	A D 3E	Q208	B C 2E	R606	B C 12C
C211	A D 3C	D602	A D 3E	Q209	A D 11B	R607	B C 12B
C212	B C 2C	D603	A D 6E	Q1411	B C 7C	R608	B C 12B
C213	B C 2C	IC		Q1412	A D 6A	R609	B C 12B
C214	B C 2B	IC201	A D 2B	Q1413	B C 6A	R610	B C 12B
C215	B C 3C	IC601	A D 5D	RESISTOR		R611	B C 9B
C216	A D 2D	IC602	A D 12B	R201	A D 2D	R612	B C 9B
C217	A D 11B	IC603	A D 12D	R202	B C 3C	R613	B C 9B
C601	A D 3E	COIL		R203	B C 2D	R614	B C 9C
C602	A D 3E	L201	A D 2E	R204	B C 1D	R615	B C 9C
C603	A D 12C	L202	A D 2D	R205	B C 1D	R616	B C 9C
C604	B C 12C	L203	A D 1C	R206	B C 1D	R617	B C 9C
C605	A D 12B	L204	A D 1C	R207	B C 2D	R618	B C 9D
C606	B C 12B	L205	A D 2C	R208	B C 3D	R1411	B C 7C
C607	A D 13B	L206	A D 3C	R209	B C 2B	R1412	A D 6A
C608	A D 13E	L207	A D 1E	R210	A D 3D	R1413	B C 6A
C609	B C 13E	L601	A D 5D	R211	B C 3C	R1414	B C 6A
C610	A D 11D	L1411	A D 8B	R212	B C 2C	R1415	B C 7A
C611	A D 11D	L1412	A D 8B	R213	B C 2C	OTHERS	
C612	A D 12C	L1413	A D 8C	R214	B C 1C	EQ201	A D 1D
C613	A D 13C	L1414	B C 8B	R215	B C 3B	J1411	A D 7B
C614	A D 13C	L1415	B C 8B	R216	B C 4B	J1412	A D 7D
C615	A D 13C	L1416	A D 8B	R217	B C 4C	J1413	A D 1A
C616	B C 4E	L1417	A D 8C	R218	B C 4C	S1411	A D 12A
C617	B C 4D	L1418	A D 8C	R219	B C 1C		
C1411	B C 8B	L1419	A D 8E	R220	B C 3C		
C1412	B C 8B	L1420	B C 8C	R221	B C 6B		
C1413	B C 8B	L1421	B C 8C	R222	B C 6C		
C1415	B C 9C			R223	B C 2D		
C1416	B C 8C			R224	B C 2E		

A vertical scale with five horizontal tick marks. The numbers 1, 2, 3, 4, and 5 are placed to the left of the tick marks, increasing from bottom to top.

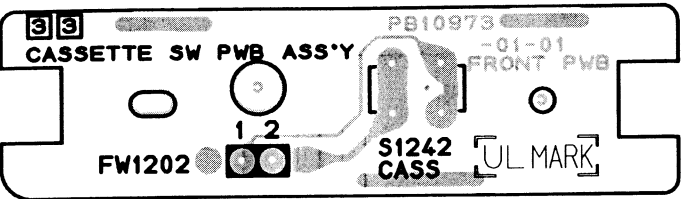


4.15 SW/DISPLAY, SW/JACK, REC SAFETY AND CASSETTE SW CIRCUIT BOARDS

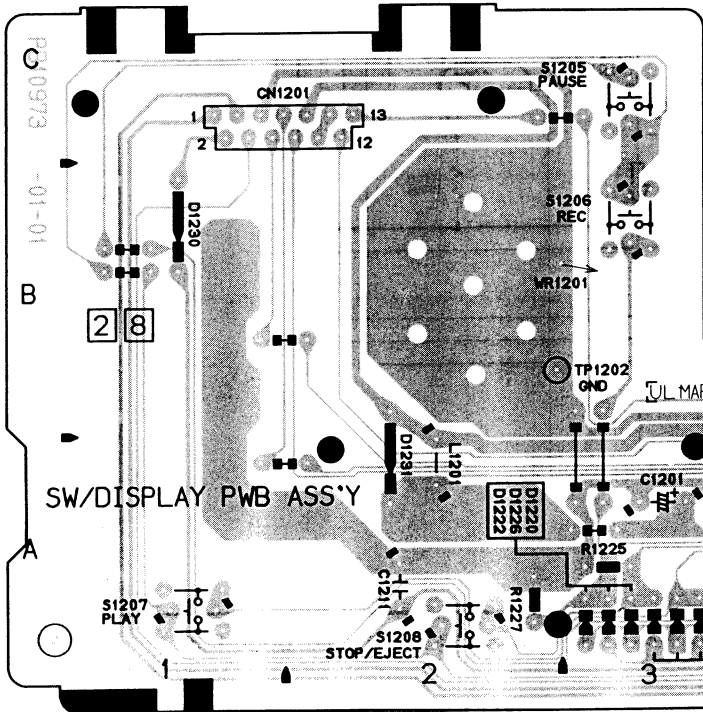
— REC SAFETY —



— CASSETTE SW —

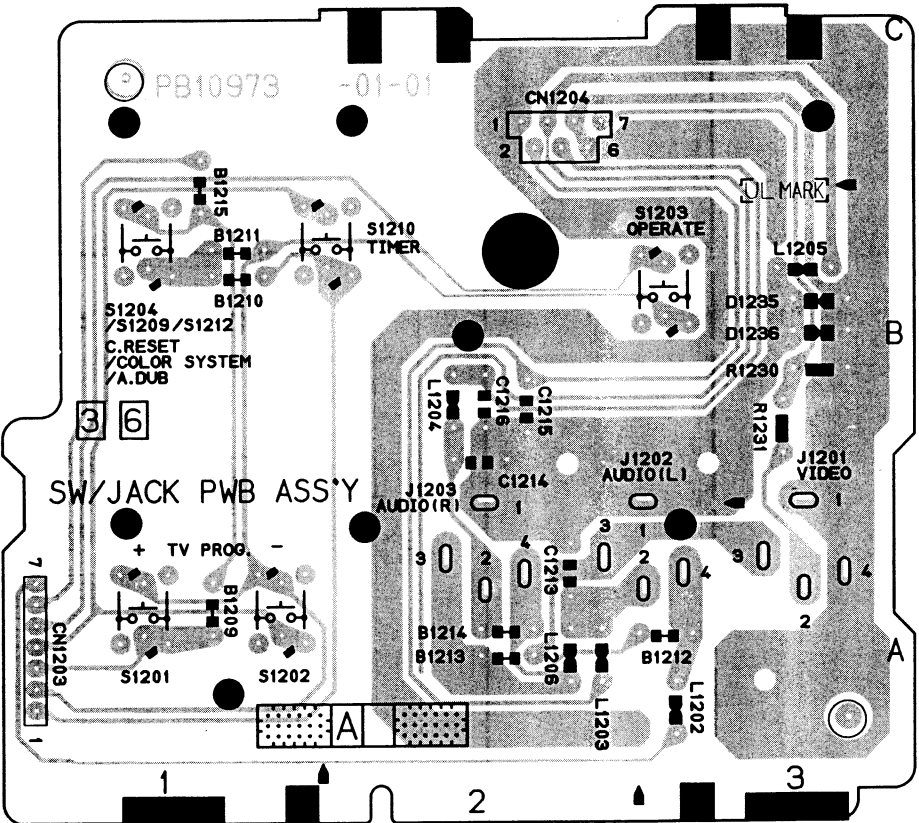


— SW/DISPLAY —



COMPONENT PARTS LOCATION GUIDE <SW/JACK PWB>

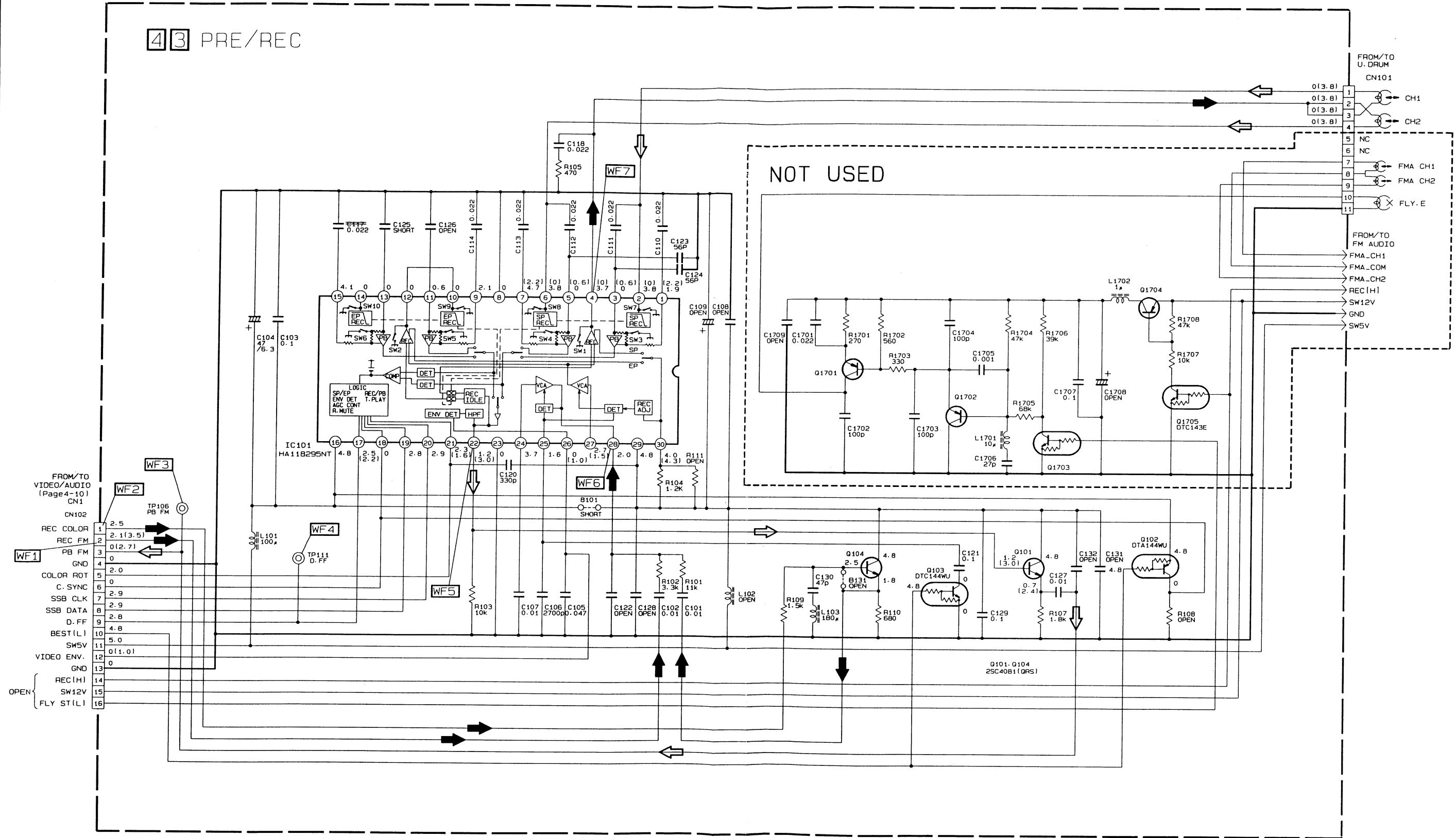
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CAPACITOR		OTHERS	
C1213	A D 2A	J1201	A D 3A
C1214	A D 2B	J1202	A D 3A
C1215	A D 2B	J1203	A D 2A
C1216	A D 2B	S1201	A D 1A
CONNECTOR		S1202	A D 1A
CN1203	A D 1A	S1203	A D 3B
CN1204	A D 2C	S1204	A D 1B
DIODE		S1210	A D 2B
D1235	A D 3B		
D1236	A D 3B		
COIL			
L1202	A D 3A		
L1203	A D 2A		
L1204	A D 2B		
L1205	A D 3B		
L1206	A D 2A		
RESISTOR			
R1230	A D 3B		
R1231	A D 3B		



COMPONENT PARTS LOCATION GUIDE <SW/DISPLAY PWB>

REF.No.	LOCATION	REF.No.	LOCATION	REF.No.	LOCATION	REF.No.	LOCATION
CAPACITOR		D1211	A D 4B	IC1202	A D 9A	R1217	A D 8A
C1201	A D 3A	D1212	A D 4A	COIL		R1218	A D 8A
C1202	A D 7A	D1213	A D 4A	L1201	A D 2A	R1219	A D 8A
C1203	A D 10A	D1220	A D 3A	RESISTOR		R1225	A D 3A
C1204	A D 6A	D1221	A D 3A	R1201	A D 5A	R1226	A D 4A
C1205	A D 6A	D1222	A D 3A	R1202	A D 5A	R1227	A D 2A
C1206	A D 9A	D1223	A D 3A	R1203	A D 5A	R1228	A D 4A
C1207	A D 8A	D1224	A D 3A	R1204	A D 5A	TEST POINT	
C1210	A D 10A	D1225	A D 3A	R1205	A D 6A	TP1201	A D 3A
C1211	A D 2A	D1226	A D 3A	R1206	A D 6A	TP1202	A D 2B
C1212	A D 7A	D1230	A D 1B	R1207	A D 5A	OTHERS	
CONNECTOR		D1231	A D 2B	R1208	A D 7A	DI1201	A D 7A
CN1201	A D 1C	D1232	A D 6A	R1209	A D 5A	S1205	A D 3C
CN1202	A D 10A	D1233	A D 6A	R1210	A D 10A	S1206	A D 3B
DIODE		D1234	A D 6A	R1211	A D 4A	S1207	A D 1A
D1201	A D 10A	CONNECTOR		R1212	A D 6B	S1208	A D 2A
D1202	A D 5A	FW1201	A D 9B	R1213	A D 9A	S1212	A D 10A
D1203	A D 5A	FW1202	A D 3B	R1214	A D 8A	S1213	A D 4A
D1204	A D 5A	IC		R1215	A D 6B	S1216	A D 4A
D1210	A D 8A	IC1201	B C 7A	R1216	A D 3A	WR1201	A D 3B

4.16 PRE/REC SCHEMATIC DIAGRAM



4-35

4-36

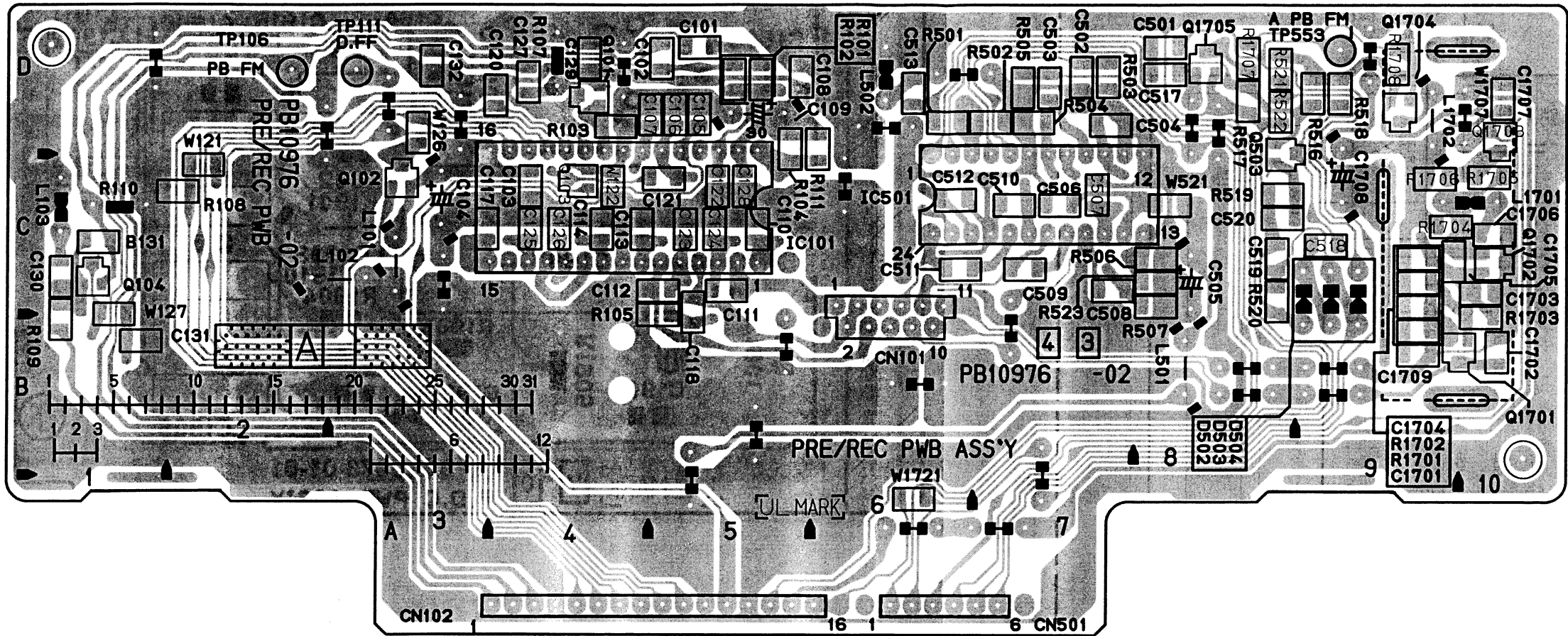
E

F

G

H

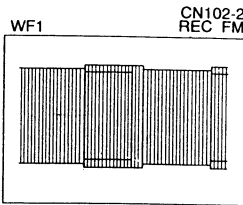
4.17 PRE/REC CIRCUIT BOARD



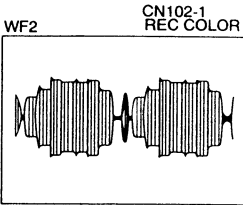
COMPONENT PARTS LOCATION GUIDE <PRE/REC PWB>

REF.No. LOCATION				REF.No. LOCATION				REF.No. LOCATION				REF.No. LOCATION			
CAPACITOR								COIL							
C101	B	C	5D	C505	B	C	7C	L101	A	D	3C	R504	B	C	7D
C102	B	C	5D	C507	B	C	7C	L102	A	D	3C	R505	B	C	7D
C103	B	C	4C	C508	B	C	7C	L103	A	D	1C	R506	B	C	8C
C104	A	D	3C	C509	B	C	7C	L501	A	D	8B	R507	B	C	8C
C105	B	C	5D	C510	B	C	7C	L502	A	D	6D	R516	B	C	9D
C106	B	C	5D	C511	B	C	6C	L1701	A	D	10C	R517	B	C	8D
C107	B	C	5D	C512	B	C	6C	L1702	A	D	9D	R518	B	C	9D
C108	B	C	5D	C513	B	C	6D					R519	B	C	8C
C109	A	D	5D	C517	B	C	8D					R520	B	C	8C
C110	B	C	5C	C518	B	C	9C					R521	B	C	8D
C111	B	C	5C	C519	B	C	8C	Q101	B	C	4D	R522	B	C	8D
C112	B	C	5C	C520	B	C	8C	Q102	B	C	3C	R523	B	C	8C
C113	B	C	4C	C1701	B	C	9B	Q103	B	C	4C	R1701	B	C	9C
C114	B	C	4C	C1702	B	C	10B	Q104	B	C	1C	R1702	B	C	9C
C117	B	C	3C	C1703	B	C	10C	Q503	B	C	8D	R1703	B	C	10B
C118	B	C	5C	C1704	B	C	9C	Q1701	B	C	10B	R1704	B	C	9C
C120	B	C	4D	C1705	B	C	9C	Q1702	B	C	10C	R1705	B	C	10C
C121	B	C	5C	C1706	B	C	10C	Q1703	B	C	10D	R1706	B	C	9C
C122	B	C	5C	C1707	B	C	10D	Q1704	B	C	9D	R1707	B	C	8D
C123	B	C	5C	C1708	A	D	9D	Q1705	B	C	8D	R1708	B	C	9D
C124	B	C	5C	C1709	B	C	9B					TEST POINT			
C125	B	C	4C	CONNECTOR				R101	B	C	5D	TP106	A	D	2D
C126	B	C	4C	CN101	A	D	6C	R102	B	C	5D	TP111	A	D	3D
C127	B	C	4D	CN102	A	D	4A	R103	B	C	4D	TP553	A	D	9D
C128	B	C	5C	CN501	A	D	6A	R104	B	C	5D				
C129	B	C	4D	DIODE				R105	B	C	5C				
C130	B	C	1C	D502	A	D	9B	R107	A	D	4D				
C131	B	C	1B	D503	A	D	9B	R108	B	C	2C				
C132	B	C	3D	D504	A	D	9B	R109	B	C	1B				
C501	B	C	8D	IC				R110	A	D	1C				
C502	B	C	7D	IC101	A	D	5C	R111	B	C	6D				
C503	B	C	7D	IC501	A	D	6D	R501	B	C	6D				
C504	B	C	7D					R502	B	C	7D				
								R503	B	C	7D				

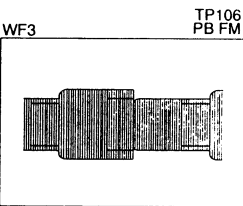
WAVEFORMS



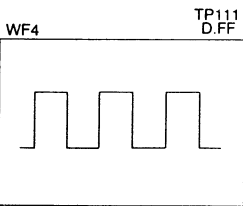
REC 3.0Vp-p
0.1V/5m sec/DIV



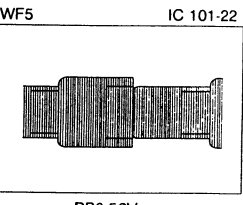
REC 3.6Vp-p
0.2V/20 μsec /DIV



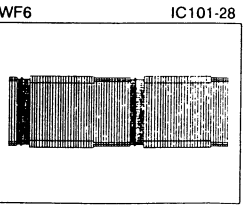
PB0.44Vp-p
20mV/5m sec/DIV



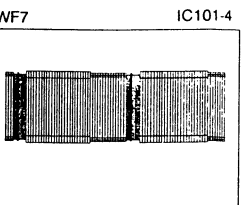
REC/PB 5.2Vp-p
0.2V/10m sec/DIV



PB0.56Vp-p
20mV/5msec/DIV

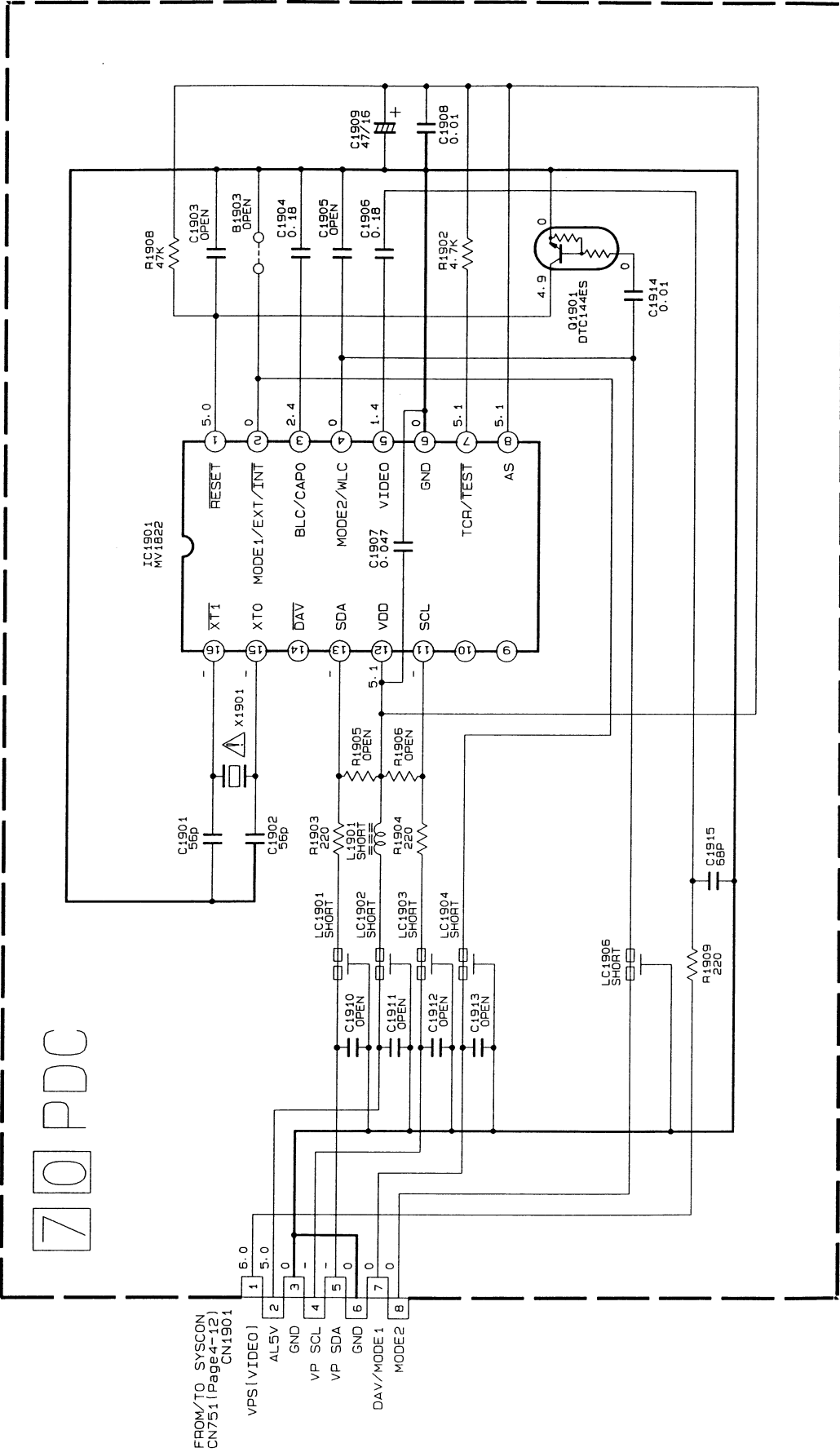


REC0.28Vp-p
10mV/5m sec/DIV

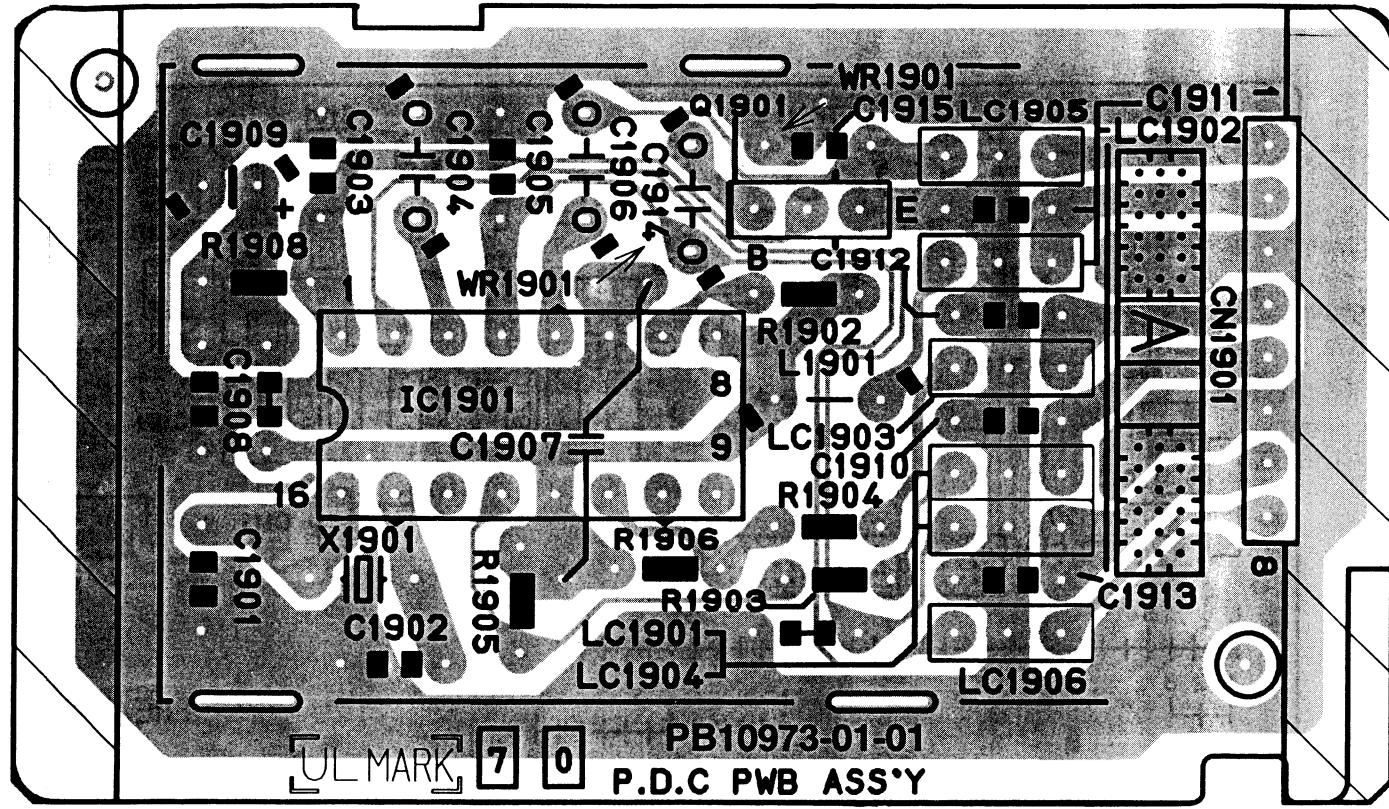


REC 2.0Vp-p
0.1V/5m sec/DIV

4.18 PDC SCHEMATIC DIAGRAM

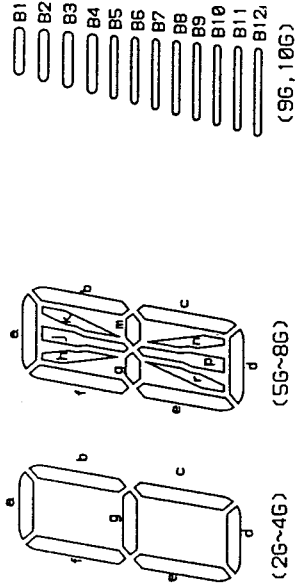
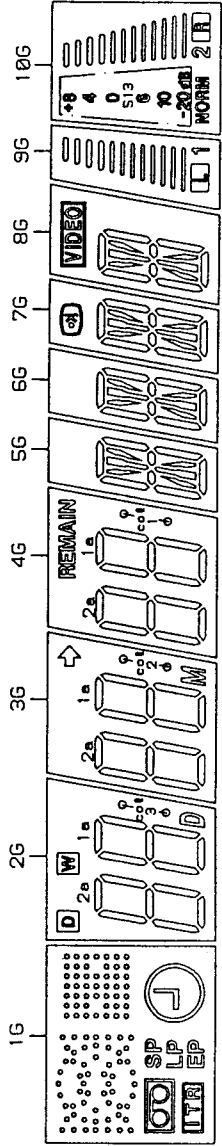


4.19 PDC CIRCUIT BOARD



4.20 FDP GRID ASSIGNMENT, SEGMENT DESIGNATION AND ANODE CONNECTION

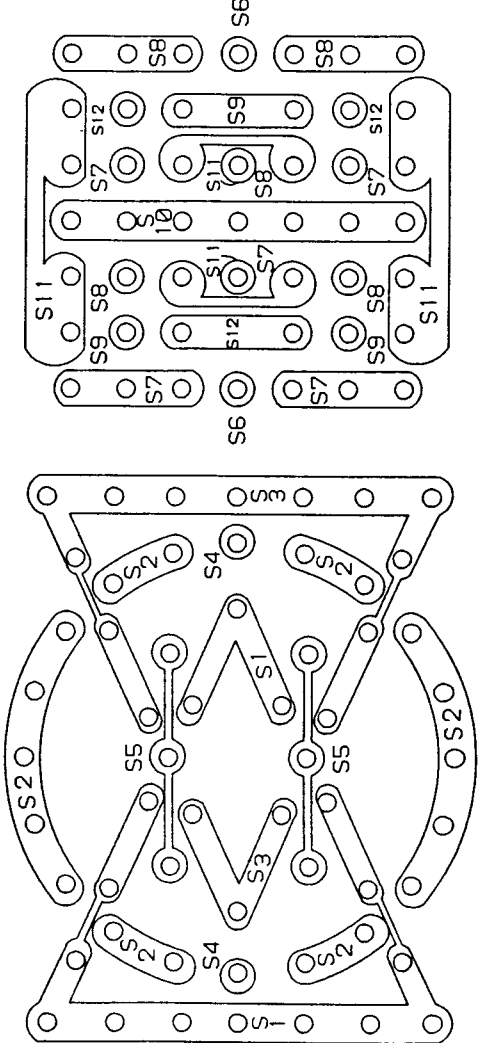
GRID ASSIGNMENT



ANODE CONNECTION

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G
P1	S1	2a	2a	2a	a	a	a	a	B1	B1
P2	S2	2b	2b	2b	b	b	b	b	B2	B2
P3	S4	2f	2f	2f	f	f	f	f	B3	B3
P4	S5	2g	2g	2g	h	h	h	h	B4	B4
P5	S3	2c	2c	2c	j	j	j	j	B5	B5
P6	S6	2e	2e	2e	k	k	k	k	B6	B6
P7	S7	2d	2d	2d	g	g	g	g	B7	B7
P8	S8	D	M	-	m	m	m	m	B8	B8
P9	S12	1a	1a	1a	c	c	c	c	B9	B9
P10	S9	1b	1b	1b	e	e	e	e	B10	B10
P11	S11	1f	1f	1f	n	n	n	n	B11	B11
P12	S10	1g	1g	1g	p	p	p	p	B12	B12
P13	10	1c	1c	1c	r	r	r	r	L	R
P14	SP	1e	1e	1e	d	d	d	d	1	2
P15	LP	1d	1d	1d	-	-	-	-	-	S13
P16	1	col3	col2	col1	-	-	-	-	-	NORM
P17	EP	D	REMAIN	-	-	-	VIDEO	-	-	-
P18	LTR	W	-	-	-	-	-	-	-	-

SEGMENT DESIGNATION

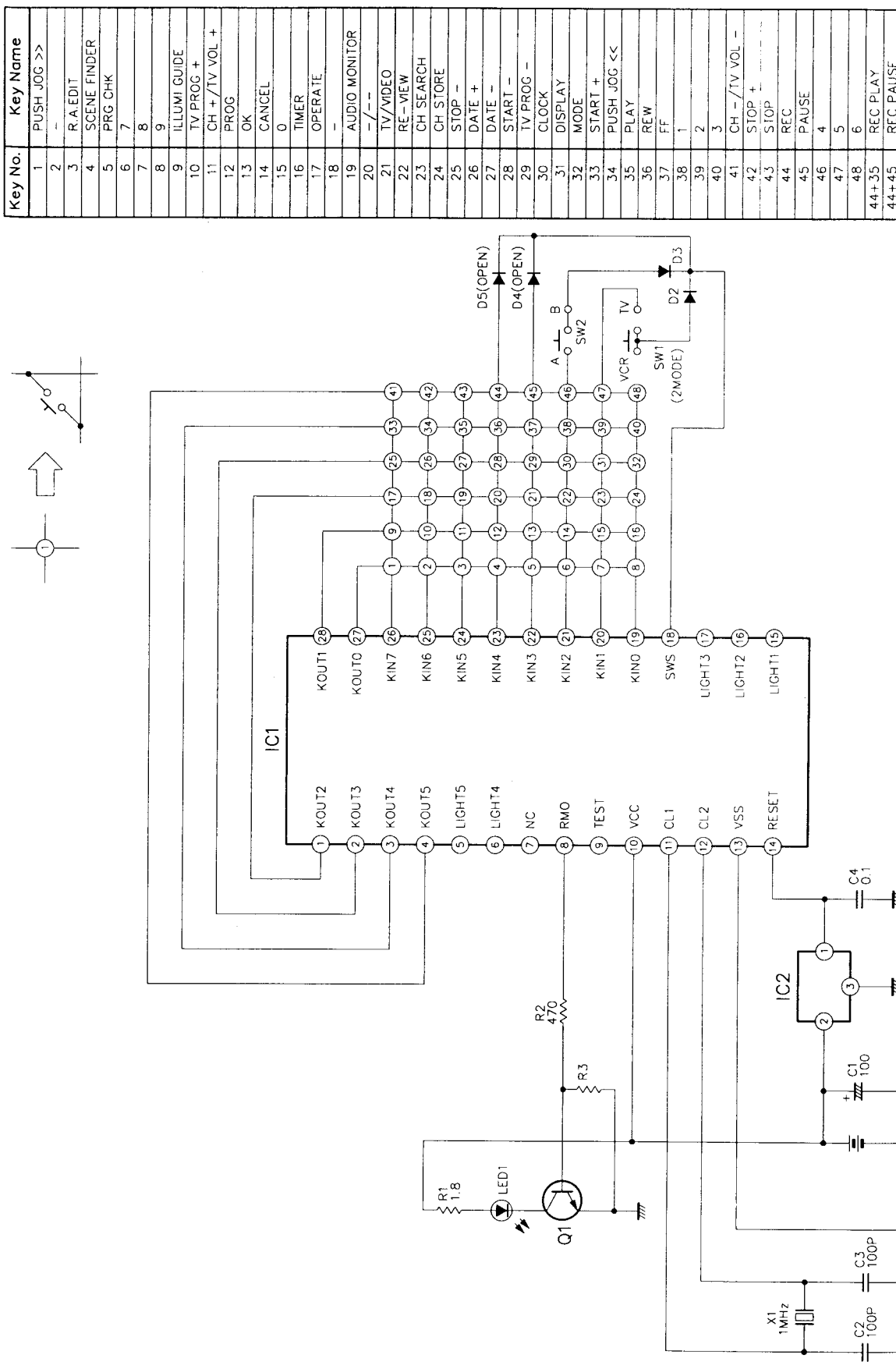
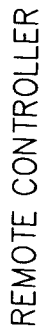


4.21 REMOTE CONTROL SCHEMATIC DIAGRAM

1. All parts shown in this schematic are critical for safety

2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

PEAC0442

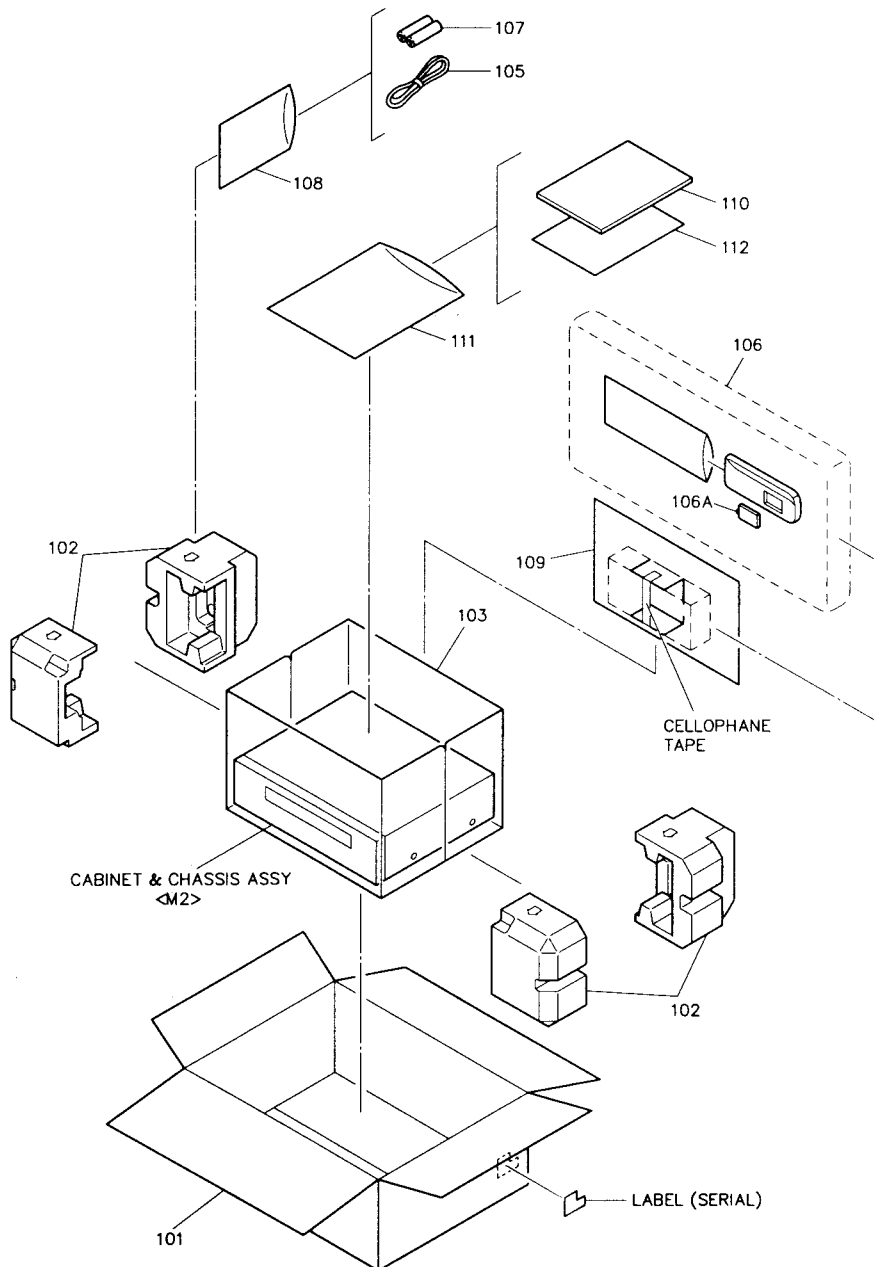


SECTION 5 PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>



#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

PACKING AND ACCESSORY ASSEMBLY <M1>

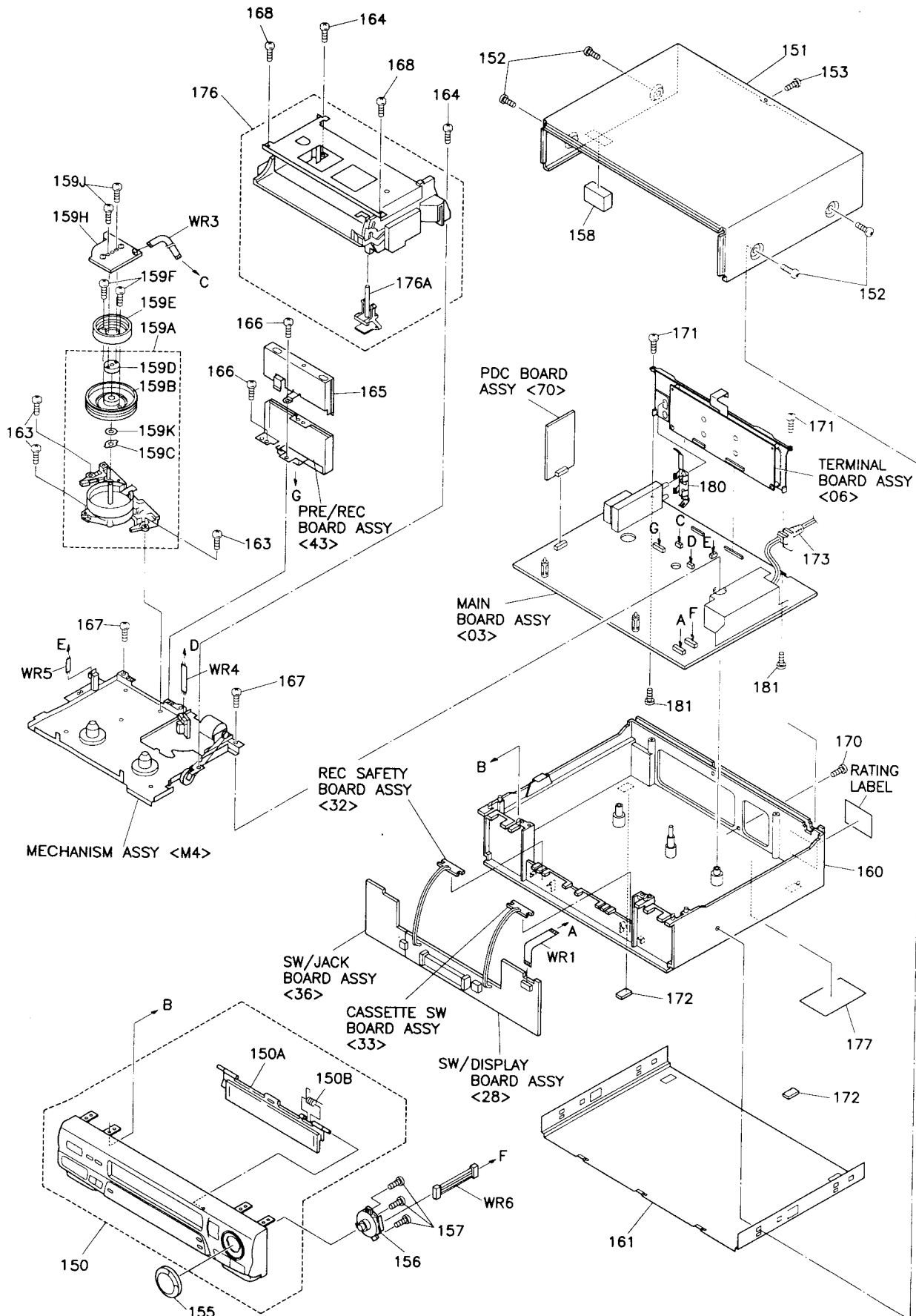
	101	PQ35532-11	PACKING CASE
	102	PQ35533A-1	CUSHION ASSEMBLY
	103	PQM30021-93	POLY(FOAM)BAG
⚠	105	PEAC0300-02	RF CABLE
⚠	106	PQ21953A-3	REMOTE CONTROLLER

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
		106A	PQ46614	COVER(BATTERY)
		107	R6PRPA-2ST	BATTERY,X2
		108	PQ35364	POLY BAG
		109	PQ35551	SHEET,REMOTE CONTROLLER
⚠		110	PU30425-1808	INSTRUCTIONS
		111	PQ35364-4	POLY BAG
		112	PQ45146-96	SHEET(SPAIN)

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.

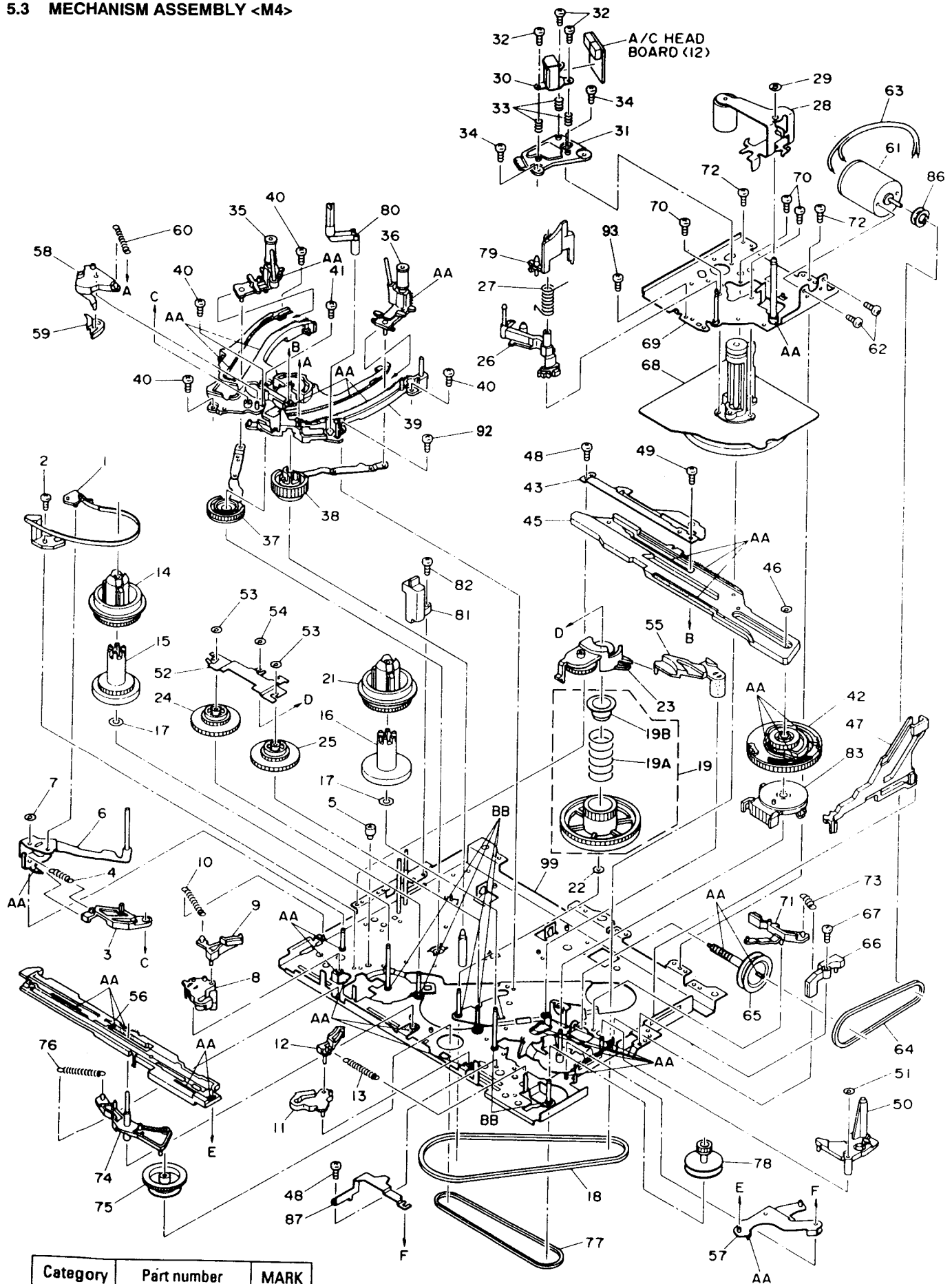


#	REF No.	PART No.	PART NAME, DESCRIPTION

CABINET AND CHASSIS ASSEMBLY <M2>

	150	PQ11906G	FRONT PANEL ASSEMBLY
	150A	PQ21915-5	CASSETTE DOOR
	150B	PQ46448	TORSION SPRING
△	151	PQ11676-7	TOP COVER
	152	SDSF3010M	SCREW,X4 SIDE
	153	SDSF3010M	SCREW,REAR
	155	PQ35473	KNOB (SHUTTLE)
	156	PEME0913	SHUTTLE ASSEMBLY
	157	SDSF2608Z	SCREW,X3
	158	PQM30029-244	SPACER
	159A	PDM2282D	DRUM SUB ASSEMBLY
	159B	PDM3403D	UPPER DRUM ASSEMBLY
	159C	PDM4400C-3	BRUSH ASSEMBLY
	159D	PDM4345A	COLLAR ASSEMBLY
	159E	PDZ0141-2	ROTOR ASSEMBLY
	159F	SPSH2660Z	SCREW,X2
	159J	SPSP2606Z	SCREW,X2
△	159H	PDZ0141-1-2	STATOR ASSEMBLY
	159K	PDM4050-10	WASHER
△	160	PQ11666-3-14	BOTTOM CHASSIS
△	161	PQ11668-2	BOTTOM COVER
	163	SPST2608Z	SCREW,X3 DRUM
	164	SPST2610Z	SCREW,X2 CASS HOUS ASSY
	165	PQ21740-1-1	SHIELD CASE,PRE
	166	SDST2606Z	SCREW,X2 PRE
	167	SDSF4012Z	SCREW,X2 MECH
	168	SDSF3010Z	SCREW,X2 CASS HOUS ASSY
	170	SDSF3010M	SCREW,TERMINAL
	171	SDSF3010Z	SCREW,X2 TERMINAL
	172	PQ43013-3	FOOT,X2
△	173	QMP4A10-170	POWER CORD
	176	PUS29724B-1	CASSETTE HOUSING ASSY
	176A	PQ46359	CASSETTE SWITCH PIN
△	177	PQ46485	SPACER(SAFETY)
	180	PQ21623-1-2	EARTH PLATE(RF)
	181	SDSF3008Z	SCREW,X2 EARTH PLATE
	WR1	PW30802-1314	WIRE, SW/DISP CN1201
	WR3	PW30803-0414	WIRE,DRUM
	WR4	PW30101-C0HH887	WIRE,A/C HEAD
	WR5	PW30101-P0HH882	WIRE,FE HEAD
	WR6	PW30218-0441613	WIRE,JOG

5.3 MECHANISM ASSEMBLY <M4>



Category	Part number	MARK
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

#△ REF No. PART No. PART NAME, DESCRIPTION

MECHANISM ASSEMBLY <M4>

1	PQ46298A-5	TENSION BAND ASSEMBLY
2	SDST2608Z	SCREW
3	PQ35012-1-3	TENSION ARM LEVER
4	PQM30001-385109	TENSION SPRING
5	PQ46302-1-3	ADJUST PIN
6	PQ46303B-7	TENSION ARM ASSEMBLY
7	PQM30017-47	SLIT WASHER
8	PQ46548A	MAIN BRAKE ASSEMBLY (SUPPLY)
9	PQ46306A-3	SUB BRAKE ASSEMBLY (SUPPLY)
10	PQM30001-393	TENSION SPRING
11	PQ46550A	MAIN BRAKE ASSEMBLY (TAKE UP)
12	PQ46309A-4	SUB BRAKE ASSEMBLY (TAKE UP)
13	PQM30001-389102	TENSION SPRING
14	PQ46499A-3	REEL ASSEMBLY (SUPPLY)
15	PQ35014-1-1	SLIT DISK (SUPPLY)
16	PQ35015-1-1	SLIT DISK (TAKE UP)
17	PQM30018-69	SPACER,X2
18	PQM30003-38	BELT(CAPSTAN)
19	PQ46497B-2	PULLEY ASSEMBLY
19A	PQM30002-233	COMPRESION SPRING
19B	PQ46311	SPRING CAP
21	PQ46498A-2	REEL ASSEMBLY (TAKE UP)
22	PQM30018-69	SPACER
23	PQ46312B-8	IDLER ARM ASSEMBLY
24	PQ46316A-1	CLUTCH UNIT (SUPPLY)
25	PQ46323A-1	CLUTCH UNIT (TAKE UP)
26	PQ46325B-8	GUIDE ARM ASSEMBLY
27	PQ46326-2	TORSION SPRING
28	PQ46327A	PINCH ROLLER ARM ASSEMBLY
29	PQM30017-24	SLIT WASHER,P LEVER
30	PEHE0182	AUDIO CONTROL HEAD
31	PQ35206-1-3	HEAD BASE
32	PQ43687A	SPECIAL SCREW,X3
33	PQM30002-192	COMPRESSION SPRING,X3
34	SDSP2604Z	SCREW,X2
35	PQ46595A	POLE BASE ASSEMBLY (SUPPLY)
36	PQ46597A	POLE BASE ASSEMBLY (TAKE UP)
37	PQ46332A-3	LOADING ARM ASSEMBLY (SUPPLY)
38	PQ46337A-6	LOADING ARM ASSEMBLY (TAKE UP)
39	PQ11657-1-9	GUIDE RAIL
40	SPST2608Z	SCREW,X4
41	SDST2612Z	SCREW
42	PQ21684-1-3	CONTROL CAM

#△ REF No.	PART No.	PART NAME, DESCRIPTION
43	PQ35138-1-2	CONTROL BRACKET
45	PQ11658-1-12	CONTROL PLATE
46	PQM30017-8	SLIT WASHER
47	PQ21685-2-9	PINCH PLATE
48	SPST2606Z	SCREW,X2
49	SPSF2608M	SCREW
50	PQ46342B-10	LEVER ASSEMBLY
51	PQM30017-8	SLIT WASHER
52	PQ35083-1-8	REEL BRACKET
53	PQM30017-51	SLIT WASHER,X2
54	Q03093-830	WASHER
55	PQ35026-1-7	IDLER LEVER
56	PQ11659-1-11	SLIDE PLATE
57	PQ46344A-2	CHANGE LEVER ASSEMBLY
58	PQ21686-1-3	TAKE UP LEVER ASSEMBLY
59	PQ46345-1-2	TAKE UP HEAD
60	PQM30001-387106	TENSION SPRING
△ 61	PU60628-3-2	LOADING MOTOR
62	SPSP3003Z	SCREW,X2
63	PW30101-80AJ632	WIRE
64	PQM30003-39	BELT
65	PQ46395B	WORM GEAR ASSEMBLY
66	PQ21699	WORM BEARING
67	SPST2606Z	SCREW
△ 68	PU61487-2	CAPSTAN MOTOR
69	PQ46347F-15	SUB DECK ASSEMBLY
70	SPSG2608Z	SCREW,X3
71	PQ46356C-3	CAPSTAN BRAKE ASSEMBLY
72	SPST2606Z	SCREW,X2
73	PQM30001-384101	TENSION SPRING,CAPSTAN BRAKE
74	PQ46353A-2	CHANGE ARM ASSEMBLY
75	PQ46354	CHANGE GEAR
76	PQM30001-386	TENSION SPRING
77	PQM30003-40	BELT
78	PQ46355	CASSETTE GEAR
79	PQ35030-1-5	LID GUIDE
80	PQ21689-2	LED PRISM
81	PEHE0237	FULL ERASE HEAD
82	SDST2610Z	SCREW
83	PU61432-1-1	ROTARY ENCODER
86	PQ43546-1-2	MOTOR PULLEY
87	PQ35217-1-2	CONTROL BRACKET 2
92	SDST2608Z	SCREW
93	SDST2608Z	SCREW
99	PQ21680D-18	MAIN DECK ASSEMBLY

5.4 ELECTRICAL PARTS LIST

#△ REF No. PART No. PART NAME, DESCRIPTION

MAIN BOARD ASSEMBLY <03>

PW1	PB10980D-01	MAIN BOARD ASSEMBLY
IC1	HA118203AF	IC
IC2	MSM7470-71MS-XE	IC
IC701	HD6433929TA35F	QFP IC (MCU)
IC702	24LC08B/P	IC
	or X24C08-10P	IC
	or AT24C08-10PC	IC
IC703	S-80728AN-Z	IC
	or RE5VA28A	IC
	or RE5VL28A	IC
IC704	TA7291S	IC
IC705	M50253P	IC
	or BU2090	IC
IC706	M50253P	IC
	or BU2090	IC
IC1001	BA15218N	IC
	or M5223L	IC
	or XRA15218N	IC
IC1101	BU2885BS	IC
	or BU2884BS	IC
IC1301	LC74783-9153	IC (OSD)
Q1	2SC4081(QRS)	TRANSISTOR
	or 2SD1819A(QRS)	TRANSISTOR
Q9	DTA144WU	TRANSISTOR
	or UN511E	TRANSISTOR
Q15	2SA1576(QRS)	TRANSISTOR
	or 2SB1218A(QRS)	TRANSISTOR
Q16	DTC144WU	TRANSISTOR
	or UN521E	TRANSISTOR
Q19	2SC4081(QRS)	TRANSISTOR
	or 2SD1819A(QRS)	TRANSISTOR
Q20	DTA144WU	TRANSISTOR
	or UN511E	TRANSISTOR
Q21	2SC4081(QRS)	TRANSISTOR
	or 2SD1819A(QRS)	TRANSISTOR
Q258	2SA1576(QRS)	TRANSISTOR
	or 2SB1218A(QRS)	TRANSISTOR
Q301	DTC114EU	TRANSISTOR
	or UN5211	TRANSISTOR
Q302	DTA144WU	TRANSISTOR
	or UN511E	TRANSISTOR
Q303	DTC114TU	TRANSISTOR
	or UN5215	TRANSISTOR
Q304	DTA114EU	TRANSISTOR
	or UN5111	TRANSISTOR
Q305	2SC4081(QRS)	TRANSISTOR
	or 2SD1819A(QRS)	TRANSISTOR
Q306	2SC4081(QRS)	TRANSISTOR
	or 2SD1819A(QRS)	TRANSISTOR
Q307	2SA1576(QR)	TRANSISTOR
Q308	2SA1576(QR)	TRANSISTOR
Q310	2SC4081(QRS)	TRANSISTOR
	or 2SD1819A(QRS)	TRANSISTOR
Q314	DTA144WU	TRANSISTOR
	or UN511E	TRANSISTOR
Q701	2SC4081(QRS)	TRANSISTOR
	or 2SD1819A(QRS)	TRANSISTOR
Q702	DTC114WU	TRANSISTOR

#△ REF No.	PART No.	PART NAME, DESCRIPTION
Q704	PN268VI	PHOTO TRANSISTOR
Q705	PN268VI	PHOTO TRANSISTOR
Q708	DTC114EU	TRANSISTOR
	or UN5211	TRANSISTOR
Q711	2SC4081(QRS)	TRANSISTOR
	or 2SD1819A(QRS)	TRANSISTOR
Q901	2SK2632-CB14	FE TRANSISTOR
	or 2SK2129-LT	FE TRANSISTOR
Q902	2SC3616(ML)	TRANSISTOR
Q951	2SD1913(RS)	TRANSISTOR
	or 2SD2061(F)	TRANSISTOR
Q952	2SC4081(RS)	TRANSISTOR
Q953	2SC3616(MLK)	TRANSISTOR
Q954	DTA114EU	TRANSISTOR
Q955	2SD2144S(UVW)	TRANSISTOR
Q956	2SB1256	TRANSISTOR
Q957	DTC114TU	TRANSISTOR
Q958	2SC1740S(RS)	TRANSISTOR
	or 2SC3199(GB)-TJK	TRANSISTOR
Q960	2SB1256	TRANSISTOR
Q1002	2SB810H,J	TRANSISTOR
Q1003	2SC3068	TRANSISTOR
Q1004	2SA1576(RS)	TRANSISTOR
Q1005	2SC4081(RS)	TRANSISTOR
Q1008	2SA1576(RS)	TRANSISTOR
Q1011	2SC4081(RS)	TRANSISTOR
Q1012	2SA1576(RS)	TRANSISTOR
Q1013	2SA1576(RS)	TRANSISTOR
Q1014	DTC144WU	TRANSISTOR
Q1015	DTC144WU	TRANSISTOR
Q1101	DTC114EU	TRANSISTOR
	or UN5211	TRANSISTOR
Q1301	2SC4081(QRS)	TRANSISTOR
	or 2SD1819A(QRS)	TRANSISTOR
Q1302	2SA1576(QRS)	TRANSISTOR
	or 2SB1218A(QRS)	TRANSISTOR
Q1951	2SA1576(QRS)	TRANSISTOR
	or 2SB1218A(QRS)	TRANSISTOR
Q1952	2SA1576(QRS)	TRANSISTOR
	or 2SB1218A(QRS)	TRANSISTOR
D5	1SS133	DIODE
	or 1N4148M	DIODE
	or MA165	DIODE
D10	1SS133	DIODE
	or MA165	DIODE
	or 1N4148M	DIODE
D11	1SS133	DIODE
	or 1N4148M	DIODE
	or MA165	DIODE
D254	1SS133	DIODE
	or MA165	DIODE
	or 1N4148M	DIODE
D301	1N4148M	DIODE
	or 1SS133	DIODE
D701	RD9.1ES-T1B2	ZENER DIODE
	or MTZJ9.1(B)	ZENER DIODE
D702	11ES2	DIODE
D703	1N4148M	DIODE
	or MA165	DIODE
	or 1SS133	DIODE
D704	11ES2	DIODE

#△ REF No.	PART No.	PART NAME, DESCRIPTION	#△ REF No.	PART No.	PART NAME, DESCRIPTION
D705	1N4148M	DIODE	D963	1SS133	DIODE
	or MA165	DIODE		or 1N4148M	DIODE
	or 1SS133	DIODE		or MA165	DIODE
D706	1N4148M	DIODE	D964	11ES2	DIODE
	or 1SS133	DIODE		or ERA15-02	DIODE
	or MA165	DIODE	D965	AU01Z	FR DIODE
D709	1N4148M	DIODE		or ERA18-02-T2	FR DIODE
	or MA165	DIODE		or 1SR153-200-T2	FR DIODE
	or 1SS133	DIODE		or 10ELS2	FR DIODE
D710	SIR-381SB3FM	LE DIODE	D968	AU01Z	FR DIODE
	or SIR-381SB3FX1M	LE DIODE		or ERA18-02-T2	FR DIODE
D714	1N4148M	DIODE		or 1SR153-200-T2	FR DIODE
	or MA165	DIODE		or 10ELS2	FR DIODE
	or 1SS133	DIODE	D969	AU01Z	FR DIODE
D715	1N4148M	DIODE		or ERA18-02-T2	FR DIODE
	or 1SS133	DIODE		or 1SR153-200-T2	FR DIODE
	or MA165	DIODE		or 10ELS2	FR DIODE
D901	S1WB(A)60F4102	BRIDGE DIODE	D1001	MTZ10D	ZENER DIODE
	or S1WB(A)60F4062X	BRIDGE DIODE	D1002	MTZJ33(C)	ZENER DIODE
	or S1WB(A)60F4072X	BRIDGE DIODE		or UZ33BSC	DIODE
D908	1SS133	DIODE	D1004	1SS133	DIODE
	or 1N4148M	DIODE		or 1N4148M	DIODE
	or MA165	DIODE		or MA165	DIODE
D909	UZ27BSB	ZENER DIODE	D1005	1SS133	DIODE
	or MTZJ27(B)	ZENER DIODE		or MA165	DIODE
	or RD27ES-T1B2	ZENER DIODE		or 1N4148M	DIODE
D910	AU01	FR DIODE	R1	QRSA08J-332YN	RESISTOR 3.3kΩ, 1/10W
	or ERA18-04-T2	FR DIODE	R2	QRSA08J-681YN	RESISTOR 680Ω, 1/10W
	or 1SR153-400-T2	FR DIODE	R3	QRSA08J-222YN	RESISTOR 2.2kΩ, 1/10W
	or 10ELS4	FR DIODE	R4	QRSA08J-182YN	RESISTOR 1.8kΩ, 1/10W
D911	AU01	FR DIODE	R5	QRSA08J-821YN	RESISTOR 820Ω, 1/10W
	or ERA18-04-T2	FR DIODE	R6	QRSA08J-821YN	RESISTOR 820Ω, 1/10W
	or 1SR153-400-T2	FR DIODE	R7	QRSA08J-0R0Y	RESISTOR 0Ω, 1/10W
	or 10ELS4	FR DIODE	R8	QRSA08J-222YN	RESISTOR 2.2kΩ, 1/10W
D951	AU01Z	FR DIODE	R9	QRSA08J-273YN	RESISTOR 27kΩ, 1/10W
	or ERA18-02-T2	FR DIODE	R10	QRSA08J-122YN	RESISTOR 1.2kΩ, 1/10W
	or 1SR153-200-T2	FR DIODE	R11	QRSA08J-392YN	RESISTOR 3.9kΩ, 1/10W
	or 10ELS2	FR DIODE	R12	QRSA08J-682YN	RESISTOR 6.8kΩ, 1/10W
D952	RL2Z-LFB2	FR DIODE	R13	QRSA08J-152YN	RESISTOR 1.5kΩ, 1/10W
	or ERC30-02-L6	FR DIODE	R14	QRSA08J-682YN	RESISTOR 6.8kΩ, 1/10W
D953	RL2Z-LFB2	FR DIODE	R15	QRSA08J-392YN	RESISTOR 3.9kΩ, 1/10W
	or ERC30-02-L6	FR DIODE	R16	QRSA08J-222YN	RESISTOR 2.2kΩ, 1/10W
D954	21DQ04	BARRIER DIODE	R31	QRSA08J-561YN	RESISTOR 560Ω, 1/10W
	or RK14LF-B2	BARRIER DIODE	R32	QRSA08J-102YN	RESISTOR 1kΩ, 1/10W
D955	RD15ES-T1B1	ZENER DIODE	R34	QRSA08J-561YN	RESISTOR 560Ω, 1/10W
	or UZ15BSA	DIODE	R35	QRSA08J-153YN	RESISTOR 15kΩ, 1/10W
	or MTZJ15(A)	ZENER DIODE	R36	QRSA08J-102YN	RESISTOR 1kΩ, 1/10W
D956	RD6.2ES-T1B3	ZENER DIODE	R43	QRD161J-225	RESISTOR 2.2MΩ, 1/6W
	or MTZJ6.2C	ZENER DIODE	R45	QRSA08J-395YN	RESISTOR 3.9MΩ, 1/10W
	or UZ6.2BSC	ZENER DIODE	R46	QRSA08J-822YN	RESISTOR 8.2kΩ, 1/10W
D958	RD30ES-T1B1	ZENER DIODE	R47	QRSA08J-681YN	RESISTOR 680Ω, 1/10W
	or UZ30BSA	ZENER DIODE	R49	QRSA08J-0R0Y	RESISTOR 0Ω, 1/10W
	or MTZJ30(A)	ZENER DIODE	R50	QRSA08J-152YN	RESISTOR 1.5kΩ, 1/10W
D959	AU01Z	FR DIODE	R51	QRSA08J-0R0Y	RESISTOR 0Ω, 1/10W
	or ERA18-02-T2	FR DIODE	R52	QRSA08J-152YN	RESISTOR 1.5kΩ, 1/10W
	or 1SR153-200-T2	FR DIODE	R53	QRD161J-273	RESISTOR 27kΩ, 1/6W
	or 10ELS2	FR DIODE	R57	QRD161J-222	RESISTOR 2.2kΩ, 1/6W
D960	1SS133	DIODE	R58	QRSA08J-183YN	RESISTOR 18kΩ, 1/10W
	or MA165	DIODE	R59	QRSA08J-153YN	RESISTOR 15kΩ, 1/10W
	or 1N4148M	DIODE	R61	QRSA08J-0R0Y	RESISTOR 0Ω, 1/10W
D962	RD5.1JSB2	DIODE	R62	QRSA08J-0R0Y	RESISTOR 0Ω, 1/10W
	or MA4051N(M)	ZENER DIODE	R63	QRSA08J-0R0Y	RESISTOR 0Ω, 1/10W

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R64	QRSA08J-272YN	RESISTOR	2.7kΩ, 1/10W
R65	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
R66	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
R67	QRSA08J-152YN	RESISTOR	1.5kΩ, 1/10W
R231	QRD161J-560	RESISTOR	56Ω, 1/6W
R232	QRD161J-391	RESISTOR	390Ω, 1/6W
R280	QRSA08J-561YN	RESISTOR	560Ω, 1/10W
R281	QRSA08J-182YN	RESISTOR	1.8kΩ, 1/10W
R284	QRSA08J-122YN	RESISTOR	1.2kΩ, 1/10W
R301	QRSA08J-221YN	RESISTOR	220Ω, 1/10W
R302	QRSA08J-183YN	RESISTOR	18kΩ, 1/10W
R303	QRSA08J-393YN	RESISTOR	39kΩ, 1/10W
R307	QRSA08J-682YN	RESISTOR	6.8kΩ, 1/10W
R308	QRSA08J-224YN	RESISTOR	220kΩ, 1/10W
R309	QRSA08J-121YN	RESISTOR	120Ω, 1/10W
R310	QRSA08J-223YN	RESISTOR	22kΩ, 1/10W
R313	QRSA08J-101YN	RESISTOR	100Ω, 1/10W
R314	QRSA08J-223YN	RESISTOR	22kΩ, 1/10W
R316	QRSA08J-153YN	RESISTOR	15kΩ, 1/10W
R317	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R318	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R319	QRSA08J-473YN	RESISTOR	47kΩ, 1/10W
R320	QRSA08J-183YN	RESISTOR	18kΩ, 1/10W
R321	QRSA08J-473YN	RESISTOR	47kΩ, 1/10W
R322	QRSA08J-183YN	RESISTOR	18kΩ, 1/10W
R323	QRSA08J-820YN	RESISTOR	82Ω, 1/10W
R324	QRSA08J-123YN	RESISTOR	12kΩ, 1/10W
R325	QRSA08J-3R3YN	RESISTOR	3.3Ω, 1/10W
R326	QRSA08J-562YN	RESISTOR	5.6kΩ, 1/10W
R327	QRSA08J-223YN	RESISTOR	22kΩ, 1/10W
R335	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R339	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R340	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R341	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R342	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R344	QRSA08J-224YN	RESISTOR	220kΩ, 1/10W
R701	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R702	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R703	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
R704	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R705	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R706	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R707	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R708	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R709	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R710	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R712	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R713	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R714	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R715	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R716	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R717	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R718	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R719	QRSA08J-152YN	RESISTOR	1.5kΩ, 1/10W
R720	QRSA08J-152YN	RESISTOR	1.5kΩ, 1/10W
R721	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R722	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R723	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R724	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R725	QRSA08J-271YN	RESISTOR	270Ω, 1/10W
R726	QRSA08J-271YN	RESISTOR	270Ω, 1/10W
R727	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R728	QRSA08J-271YN	RESISTOR	270Ω, 1/10W
R729	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R730	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R731	QRSA08J-221YN	RESISTOR	220Ω, 1/10W
R732	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R733	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R734	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R735	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R736	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R738	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R739	QRSA08J-101YN	RESISTOR	100Ω, 1/10W
R740	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R741	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R742	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R743	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R744	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R745	QRD161J-472	RESISTOR	4.7kΩ, 1/6W
R746	QRSA08J-332YN	RESISTOR	3.3kΩ, 1/10W
R747	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R748	QRSA08J-332YN	RESISTOR	3.3kΩ, 1/10W
R749	QRD161J-472	RESISTOR	4.7kΩ, 1/6W
R750	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R751	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R752	QRD161J-102	RESISTOR	1kΩ, 1/6W
R753	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R754	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R755	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R756	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R757	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R762	QRSA08J-221YN	RESISTOR	220Ω, 1/10W
R763	QRSA08J-221YN	RESISTOR	220Ω, 1/10W
R765	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R766	QRSA08J-474YN	RESISTOR	470kΩ, 1/10W
R767	QRSA08J-334YN	RESISTOR	330kΩ, 1/10W
R769	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R770	QRSA08J-682YN	RESISTOR	6.8kΩ, 1/10W
R771	QRSA08J-104YN	RESISTOR	100kΩ, 1/10W
R772	QRSA08J-152YN	RESISTOR	1.5kΩ, 1/10W
R773	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R774	QRSA08J-105YN	RESISTOR	1MΩ, 1/10W
R775	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R776	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R777	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R778	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R779	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R780	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R781	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R782	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R785	QRSA08J-221YN	RESISTOR	220Ω, 1/10W
R786	QRD161J-750	RESISTOR	75Ω, 1/6W
R787	QRSA08J-221YN	RESISTOR	220Ω, 1/10W
R788	QRSA08J-223YN	RESISTOR	22kΩ, 1/10W
R789	QRSA08J-223YN	RESISTOR	22kΩ, 1/10W
R790	QRD161J-103	RESISTOR	10kΩ, 1/6W
R791	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R792	QRSA08J-271YN	RESISTOR	270Ω, 1/10W
R793	QRSA08J-681YN	RESISTOR	680Ω, 1/10W
R795	QRD161J-104	RESISTOR	100kΩ, 1/6W
R800	QRSA08J-471YN	RESISTOR	470Ω, 1/10W
R801	QRSA08J-101YN	RESISTOR	100Ω, 1/10W
R802	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R803	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R804	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W	R1030	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R805	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W	R1036	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R806	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W	R1041	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R807	QRD161J-0R0	RESISTOR	0Ω, 1/6W	R1042	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R808	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W	R1043	QRSA08J-273YN	RESISTOR	27kΩ, 1/10W
R809	QRSA08J-222YN	RESISTOR	2.2kΩ, 1/10W	R1044	QRSA08J-273YN	RESISTOR	27kΩ, 1/10W
R810	QRSA08J-471YN	RESISTOR	470Ω, 1/10W	R1045	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R811	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W	R1046	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R815	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W	R1101	QRSA08J-561YN	RESISTOR	560Ω, 1/10W
R816	QRSA08J-393YN	RESISTOR	39kΩ, 1/10W	R1102	QRSA08J-561YN	RESISTOR	560Ω, 1/10W
R817	QRSA08J-392YN	RESISTOR	3.9kΩ, 1/10W	R1103	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R818	QRD161J-562	RESISTOR	5.6kΩ, 1/6W	R1104	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R821	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W	R1105	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R901	QRD161J-224	RESISTOR	220kΩ, 1/6W	R1106	QRD161J-102	RESISTOR	1kΩ, 1/6W
R902	QRD161J-224	RESISTOR	220kΩ, 1/6W	R1107	QRSA08J-562YN	RESISTOR	5.6kΩ, 1/10W
R903	QRD161J-683	RESISTOR	68kΩ, 1/6W	R1108	QRSA08J-222YN	RESISTOR	2.2kΩ, 1/10W
R904	QRD121J-331S	RESISTOR	330Ω, 1/2W	R1109	QRSA08J-562YN	RESISTOR	5.6kΩ, 1/10W
R905	QRX014J-R39Z	MF RESISTOR	0.39Ω, 1W	R1110	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R906	QRSA08J-681YN	RESISTOR	680Ω, 1/10W	R1111	QRSA08J-821YN	RESISTOR	820Ω, 1/10W
R907	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W	R1112	QRD161J-222	RESISTOR	2.2kΩ, 1/6W
R909	QRSA08J-152YN	RESISTOR	1.5kΩ, 1/10W	R1113	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R910	QRSA08J-222YN	RESISTOR	2.2kΩ, 1/10W	R1114	QRD161J-103	RESISTOR	10kΩ, 1/6W
R911	QRSA08J-224YN	RESISTOR	220kΩ, 1/10W	R1301	QRSA08J-392YN	RESISTOR	3.9kΩ, 1/10W
R912	QRG02DJ-683X	OMF RESISTOR	68kΩ, 2W	R1302	QRSA08J-331YN	RESISTOR	330Ω, 1/10W
R951	QRSA08J-471YN	RESISTOR	470Ω, 1/10W	R1303	QRSA08J-151YN	RESISTOR	150Ω, 1/10W
R952	QRV144F-2211AY	CMF RESISTOR	2.21kΩ, 1/4W	R1304	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
R953	QRV144F-3481AY	CMF RESISTOR	3.48kΩ, 1/4W	R1306	QRSA08J-152YN	RESISTOR	1.5kΩ, 1/10W
R954	QRSA08J-122YN	RESISTOR	1.2kΩ, 1/10W	R1307	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R955	QRG02DJ-222X	OMF RESISTOR	2.2kΩ, 2W	R1308	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
△ R957	QRZ0077-101X	FUSIBLE RESISTOR	100Ω, 1/4W	R1309	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R958	QRSA08J-471YN	RESISTOR	470Ω, 1/10W	R1401	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
R959	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W	R1402	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R960	QRSA08J-471YN	RESISTOR	470Ω, 1/10W	R1951	QRSA08J-333YN	RESISTOR	33kΩ, 1/10W
R961	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W	R1952	QRSA08J-223YN	RESISTOR	22kΩ, 1/10W
R962	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W	R1953	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R963	QRD161J-511	RESISTOR	510Ω, 1/6W	R1954	QRSA08J-563YN	RESISTOR	56kΩ, 1/10W
R964	QRSA08J-471YN	RESISTOR	470Ω, 1/10W	R1955	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R965	QRSA08J-471YN	RESISTOR	470Ω, 1/10W	R1956	QRSA08J-101YN	RESISTOR	100Ω, 1/10W
R966	QRSA08J-473YN	RESISTOR	47kΩ, 1/10W	C3	QCYA1EK-104	CAPACITOR	0.1μF, 25V
R967	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W	C5	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
R968	QRSA08J-222YN	RESISTOR	2.2kΩ, 1/10W	C6	QEKJ1CM-106	E CAPACITOR	10μF, 16V
R970	QRX014J-9R1Z	MF RESISTOR	9.1Ω, 1W	C7	QCYA1HK-103	CAPACITOR	0.01μF, 50V
R973	QRSA08J-562YN	RESISTOR	5.6kΩ, 1/10W	C9	QEKJ0JM-476	E CAPACITOR	47μF, 6.3V
R974	QRSA08J-223YN	RESISTOR	22kΩ, 1/10W	C10	QCYA1HK-103	CAPACITOR	0.01μF, 50V
R978	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W	C11	QEKJ1HM-335	E CAPACITOR	3.3μF, 50V
R979	QRSA08J-222YN	RESISTOR	2.2kΩ, 1/10W	C12	QEKJ1HM-225	E CAPACITOR	2.2μF, 50V
R1001	QRSA08J-152YN	RESISTOR	1.5kΩ, 1/10W	C13	QCYA1EK-104	CAPACITOR	0.1μF, 25V
R1002	QRSA08J-153YN	RESISTOR	15kΩ, 1/10W	C14	QCTA1CH-221	CAPACITOR	220pF, 16V
R1003	QRSA08J-331YN	RESISTOR	330Ω, 1/10W	C15	QCTA1CH-680	CAPACITOR	68pF, 16V
R1004	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W	C16	QEKJ1HM-225	E CAPACITOR	2.2μF, 50V
R1005	QRD161J-103	RESISTOR	10kΩ, 1/6W	C17	QEKJ1HM-474	E CAPACITOR	0.47μF, 50V
R1006	QRD161J-561	RESISTOR	560Ω, 1/6W	C18	QCYA1EK-223	CAPACITOR	0.022μF, 25V
R1007	QRSA08J-223YN	RESISTOR	22kΩ, 1/10W	C19	QCYA1EK-104	CAPACITOR	0.1μF, 25V
R1008	QRSA08J-153YN	RESISTOR	15kΩ, 1/10W	C20	QCYA1EK-333	CAPACITOR	0.033μF, 25V
R1009	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W	C21	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
R1010	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W	C22	QCYA1EK-104	CAPACITOR	0.1μF, 25V
R1012	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W	C23	QEKJ0JM-476	E CAPACITOR	47μF, 6.3V
R1016	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W	C24	QCYA1EK-104	CAPACITOR	0.1μF, 25V
R1021	QRSA08J-471YN	RESISTOR	470Ω, 1/10W	C25	QEKJ1HM-335	E CAPACITOR	3.3μF, 50V
R1022	QRSA08J-104YN	RESISTOR	100kΩ, 1/10W	C26	QENF1CM-106	NP E CAPACITOR	10μF, 16V
R1023	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W	C28	QCYA1HK-103	CAPACITOR	0.01μF, 50V
R1024	QRSA08J-332YN	RESISTOR	3.3kΩ, 1/10W	C29	QEKJ1CM-106	E CAPACITOR	10μF, 16V

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C30	QEKJ1HM-104	E CAPACITOR	0.1 μ F, 50V
C31	QCYA1EK-104	CAPACITOR	0.1 μ F, 25V
C32	QEKJ1HM-335	E CAPACITOR	3.3 μ F, 50V
C34	QCYA1EK-473	CAPACITOR	0.047 μ F, 25V
C35	QCYA1CK-224	CAPACITOR	0.22 μ F, 16V
C36	QCTA1CH-390	CAPACITOR	39pF, 16V
C37	QCYA1EK-104	CAPACITOR	0.1 μ F, 25V
C38	QCTA1CH-151	CAPACITOR	150pF, 16V
C39	QCYA1EK-104	CAPACITOR	0.1 μ F, 25V
C41	QCYA1HK-103	CAPACITOR	0.01 μ F, 50V
C42	QCFA1HZ-103	CAPACITOR	0.01 μ F, 50V
C43	QCYA1EK-104	CAPACITOR	0.1 μ F, 25V
C44	QEKJ1CM-476	E CAPACITOR	47 μ F, 16V
C45	QCYA1EK-104	CAPACITOR	0.1 μ F, 25V
C46	QCYA1EK-104	CAPACITOR	0.1 μ F, 25V
C47	QCTA1CH-100	CAPACITOR	10pF, 16V
C48	QCYA1HK-183	CAPACITOR	0.018 μ F, 50V
C53	QCTA1CH-181	CAPACITOR	180pF, 16V
C54	QEKJ1HM-105	E CAPACITOR	1 μ F, 50V
C55	QENC1CM-106	NP E CAPACITOR	10 μ F, 16V
C56	QCTA1CH-6R0	CAPACITOR	6pF, 16V
C60	QRSA08J-0R0Y	RESISTOR	0 Ω , 1/10W
C61	QCTA1CH-5R0	CAPACITOR	5pF, 16V
C63	QCYA1HK-221	CAPACITOR	220pF, 50V
C64	QCTA1CH-101	CAPACITOR	100pF, 16V
C66	QCTA1CH-101	CAPACITOR	100pF, 16V
C75	QCTA1CH-330	CAPACITOR	33pF, 16V
C76	QCTA1CH-330	CAPACITOR	33pF, 16V
C271	QRSA08J-0R0Y	RESISTOR	0 Ω , 1/10W
C301	QEKJ1CM-106	E CAPACITOR	10 μ F, 16V
C302	QCYA1HK-182	CAPACITOR	0.0018 μ F, 50V
C303	QEKJ1HM-105	E CAPACITOR	1 μ F, 50V
C304	QCYA1EK-333	CAPACITOR	0.033 μ F, 25V
C306	QEKJ1EM-475	E CAPACITOR	4.7 μ F, 25V
C307	QCYA1HK-153	CAPACITOR	0.015 μ F, 50V
C308	QEKJ0JM-226	E CAPACITOR	22 μ F, 6.3V
C309	QCYA1HK-222	CAPACITOR	0.0022 μ F, 50V
C310	QEKJ1EM-475	E CAPACITOR	4.7 μ F, 25V
C314	QFLC1HJ-153Z	F CAPACITOR	0.015 μ F, 50V
C315	QEKJ1HM-105	E CAPACITOR	1 μ F, 50V
C317	QETC1HM-106	E CAPACITOR	10 μ F, 50V
C318	QCYA1HK-472	CAPACITOR	0.0047 μ F, 50V
C319	QCYA1EK-223	CAPACITOR	0.022 μ F, 25V
C320	QFLC1HJ-823Z	F CAPACITOR	0.082 μ F, 50V
C321	QCYA1HK-331	CAPACITOR	330pF, 50V
C327	QEKJ1CM-107	E CAPACITOR	100 μ F, 16V
C329	QCYA1EK-473	CAPACITOR	0.047 μ F, 25V
C701	QAT3120-450Z	TRIM CAPACITOR, TIMER CLOCK	
C702	QCTA1CH-180	CAPACITOR	18pF, 16V
C703	QCYA1HK-103	CAPACITOR	0.01 μ F, 50V
C704	QEKJ1CM-106	E CAPACITOR	10 μ F, 16V
C709	QCYA1EK-104	CAPACITOR	0.1 μ F, 25V
C710	QCTA1CH-101	CAPACITOR	100pF, 16V
C711	QCTA1CH-101	CAPACITOR	100pF, 16V
C712	QCYA1HK-102	CAPACITOR	0.001 μ F, 50V
C715	QCYA1HK-103	CAPACITOR	0.01 μ F, 50V
C717	QEKJ1CM-336	E CAPACITOR	33 μ F, 16V
C719	PU60676-223	E CAPACITOR	0.022 μ F, 5.5V
C727	QCYA1HK-103	CAPACITOR	0.01 μ F, 50V
C730	QETC1HM-106	E CAPACITOR	10 μ F, 50V
C731	QCYA1HK-103	CAPACITOR	0.01 μ F, 50V
C736	QCFA1EZ-104	CAPACITOR	0.1 μ F, 25V

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C740	QCVB1CM-103	CAPACITOR	0.01 μ F, 16V
C750	QCTA1CH-470	CAPACITOR	47pF, 16V
△ C901	QFZ9051-683	F CAPACITOR	0.068 μ F
△ C902	QFZ9051-683	F CAPACITOR	0.068 μ F
△ C903	QFZ9051-333	F CAPACITOR	0.033 μ F
C906	QETC1HM-225	E CAPACITOR	2.2 μ F, 50V
C907	QCZ0302-330Z	CAPACITOR	33pF
C908	QFV21HJ-104AZ	F CAPACITOR	0.1 μ F, 50V
C910	PECA0738-686	E CAPACITOR	
△ C911	QCZ9026-222	CAPACITOR	0.0022 μ F
C915	QFLC1HJ-183Z	F CAPACITOR	0.018 μ F, 50V
C916	QCB1HJ-271	CAPACITOR	270pF, 50V
C917	QCZ0212-472	CAPACITOR	0.0047 μ F, 1kV
C951	QEMR1AM-107	E CAPACITOR	100 μ F, 10V
C953	QEM91AM-687	E CAPACITOR	680 μ F, 10V
C954	QEM91CM-827	E CAPACITOR	820 μ F, 16V
C955	QEMR1EM-187	E CAPACITOR	180 μ F, 25V
C959	QETC1JM-226	E CAPACITOR	22 μ F, 63V
C960	QETC1HM-226	E CAPACITOR	22 μ F, 50V
C961	QFLC1HJ-103Z	F CAPACITOR	0.01 μ F, 50V
C962	QCYA1HK-102	CAPACITOR	0.001 μ F, 50V
C963	QETC1AM-107	E CAPACITOR	100 μ F, 10V
C964	QEKJ1CM-226	E CAPACITOR	22 μ F, 16V
C965	QETC1AM-107	E CAPACITOR	100 μ F, 10V
C966	QEKJ1CM-106	E CAPACITOR	10 μ F, 16V
C969	QEKJ1HM-474	E CAPACITOR	0.47 μ F, 50V
C971	QETC1AM-227	E CAPACITOR	220 μ F, 10V
C972	QETC1CM-337	E CAPACITOR	330 μ F, 16V
C1002	QCYA1HK-102	CAPACITOR	0.001 μ F, 50V
C1004	QCYA1HK-102	CAPACITOR	0.001 μ F, 50V
C1005	QCYA1EK-223	CAPACITOR	0.022 μ F, 25V
C1006	QEKJ1HM-225	E CAPACITOR	2.2 μ F, 50V
C1010	QRSA08J-0R0Y	RESISTOR	0 Ω , 1/10W
C1011	QCYA1EK-104	CAPACITOR	0.1 μ F, 25V
C1052	QCYA1HK-102	CAPACITOR	0.001 μ F, 50V
C1101	QCYA1HK-102	CAPACITOR	0.001 μ F, 50V
C1102	QCYA1HK-102	CAPACITOR	0.001 μ F, 50V
C1103	QCYA1EK-563	CAPACITOR	0.056 μ F, 25V
C1104	QCTA1CH-101	CAPACITOR	100pF, 16V
C1105	QCYA1EK-223	CAPACITOR	0.022 μ F, 25V
C1106	QCYA1HK-103	CAPACITOR	0.01 μ F, 50V
C1107	QCYA1HK-102	CAPACITOR	0.001 μ F, 50V
C1108	QCTA1CH-470	CAPACITOR	47pF, 16V
C1109	QCYA1HK-102	CAPACITOR	0.001 μ F, 50V
C1110	QCYA1HK-222	CAPACITOR	0.0022 μ F, 50V
C1111	QCYA1EK-104	CAPACITOR	0.1 μ F, 25V
C1112	QEKJ1CM-106	E CAPACITOR	10 μ F, 16V
C1113	QEKJ1CM-106	E CAPACITOR	10 μ F, 16V
C1114	QEKJ1CM-106	E CAPACITOR	10 μ F, 16V
C1115	QEKJ0JM-107	E CAPACITOR	100 μ F, 6.3V
C1116	QEKJ1HM-105	E CAPACITOR	1 μ F, 50V
C1301	QEKJ1HM-105	E CAPACITOR	1 μ F, 50V
C1302	QCTA1CH-820	CAPACITOR	82pF, 16V
C1303	QEKJ1HM-105	E CAPACITOR	1 μ F, 50V
C1304	QCTA1CH-560	CAPACITOR	56pF, 16V
C1305	QEKJ0JM-476	E CAPACITOR	47 μ F, 6.3V
C1306	QCYA1HK-103	CAPACITOR	0.01 μ F, 50V
C1307	QCSB1HJ-150	CAPACITOR	15pF, 50V
C1308	QCTA1CH-330	CAPACITOR	33pF, 16V
C1309	QCTA1CH-330	CAPACITOR	33pF, 16V
C1314	QCTA1CH-220	CAPACITOR	22pF, 16V
C1315	QCTA1CH-131	CAPACITOR	130pF, 16V

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C1951	QENC1EM-475	NP E CAPACITOR	4.7μF,25V	W15	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
C1952	QETC1HM-475	E CAPACITOR	4.7μF,50V	W16	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
C1953	QCYA1HK-103	CAPACITOR	0.01μF,50V	W17	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
C1954	QETC1HM-106	E CAPACITOR	10μF,50V	W18	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
L1	PELN0530-101JZ	COIL	100μH	W19	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
L2	PELN1203	COIL		W20	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
L3	PU59152-5R6J	COIL	5.6μH	W21	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
L4	PELN0530-101JZ	COIL	100μH	W22	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
L5	PU59152-820J	COIL	82μH	W23	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
L6	PELN0530-101JZ	COIL	100μH	W24	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
L7	PU59152-221J	COIL	220μH	W25	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
L9	PU59152-101J	COIL	100μH	W26	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
L10	PU59152-221J	COIL	220μH	△ FC901	PEMC0965-Z	FUSE CLIP	
L11	PELN0975-331JZ	COIL	330μH	△ FC902	PEMC0965-Z	FUSE CLIP	
L15	PU59152-1R0J	COIL	1μH	△ LF901	PELN1204	LINE FILTER	
L16	PU59152-1R0J	COIL	1μH	△ LF902	PELN0876	LINE FILTER	
L301	PU58308-123J	COIL	12mH	CN1	PEMC1168-013	CONNECTOR,(1-13)PRE/REC	
L703	PU48530-100K	COIL	10μH	CN301	PU60727-7	CONNECTOR,(1-7)AC HEAD	
L951	PELN0687	COIL		CN302	PU60727-2	CONNECTOR,(1-2)FE HEAD	
L953	PELN0687	COIL		CN701	PEMC1077	CONNECTOR,(1-8)CAP MDA	
L954	PU48530-101K	COIL	100μH	CN702	PU61434-1-1	CONNECTOR,(1-5)ROTARY ENCODER	
L1081	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W	CN703	PU60910-2	CONNECTOR,(1-2)LOADING MOTOR	
L1101	PU59152-270J	COIL	27μH	CN705	PU59555-4	CONNECTOR,(2-5)SHUTTLE	
L1301	PELN0530-101JZ	COIL	100μH	CN751	PEMC0714-008	CONNECTOR,(1-8)PDC/ATS +	
L1302	PU59152-220J	COIL	22μH	CN802	PEMC1101-013	CONNECTOR,(1-13)DISPLAY/SW	
L1303	PU59152-220J	COIL	22μH	△ CN901	PU60250-2	CONNECTOR,(1-2)AC IN	
L1304	PU59152-2R2J	COIL	2.2μH	CN1102	PEMC1101-004	CONNECTOR,(1-4)DRUM MOTOR	
L1305	PU59152-330J	COIL	33μH	CN1401	PEMC1168-017	CONNECTOR,(1-17)TERMINAL	
△ CF701	PEVB0594-Z	RESONATOR		CN1402	PEMC1168-012	CONNECTOR,(1-12)TERMINAL	
△ X1	PEVB0658	CRYSTAL RESONATOR		△ CP701	ICP-N25	CIRCUIT PROTECTOR	
△ X701	PEVB0422	CRYSTAL RESONATOR		△ CP901	ICP-N20	CIRCUIT PROTECTOR	
K901	PELN0662-Z	FERRITE BEADS		△ CP902	ICP-N25	CIRCUIT PROTECTOR	
△ PC901	PC123FY2	PH COUPLER		△ CP1101	ICP-N15	CIRCUIT PROTECTOR	
PS701	PU61433	REEL SENSOR		△ F901	QMF51E2-1R25J1	FUSE	T1.2A
PS702	PU61433	REEL SENSOR					
△ T301	PELN0832	OSC TRANSFORMER					
△ T901	PELN1173	SW TRANS					
T1001	PELN0806	COIL					
BK1	PQ21944-1-1	TRANS BRACKET					
ET1	PQ46601	EARTH PLATE					
HD1	PEME0978	HOLDER					
△ HS1	PQ45788-1-1	HEAT SINK					
OT1	PEME0947-01-01	SPACER,X2 MECH					
OT2	PEME0979	SPACER,X2 PRE/REC					
OT3	PQ46408-1-2	SENSOR CAP,X2					
OT4	SDST3006Z	SCREW					
△ TU1	PERF0251-01-01	IF UNIT					
△ TU1001	PERF0230	TUNER UNIT					
W1	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W2	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W3	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W4	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W5	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W6	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W7	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W8	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W9	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W10	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W11	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W12	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W13	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
W14	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				

TERMINAL BOARD ASSEMBLY <06>

PW1	PB10984D	TERMINAL BOARD ASSEMBLY
IC201	BA7630S	IC
IC602	BA15218	IC
	or XRA15218	IC
IC603	BA7631	IC
Q201	2SA1576(QRS)	TRANSISTOR
	or 2SB1218A(QRS)	TRANSISTOR
Q202	2SA1576(QRS)	TRANSISTOR
	or 2SB1218A(QRS)	TRANSISTOR
Q203	2SC4081(QRS)	TRANSISTOR
	or 2SD1819A(QRS)	TRANSISTOR
Q204	2SA1576(QRS)	TRANSISTOR
	or 2SB1218A(QRS)	TRANSISTOR
Q205	2SA1576(QRS)	TRANSISTOR
	or 2SB1218A(QRS)	TRANSISTOR
Q206	2SC4081(QRS)	TRANSISTOR
	or 2SD1819A(QRS)	TRANSISTOR
Q209	2SD1450S,T	TRANSISTOR
	or 2SD1302(ST)	TRANSISTOR

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
Q1411	2SA1576(QRS)	TRANSISTOR	
	or 2SB1218A(QRS)	TRANSISTOR	
Q1412	2SA933S(QRS)	TRANSISTOR	
	or 2SA1267(YG)-TJK	TRANSISTOR	
D201	MTZ12AT-77	ZENER DIODE	
R201	QRD123J-331SX	RESISTOR	330Ω, 1/2W
R202	QRSA08J-750YN	RESISTOR	75Ω, 1/10W
R203	QRSA08J-123YN	RESISTOR	12kΩ, 1/10W
R204	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
R205	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R206	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R207	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R208	QRSA08J-152YN	RESISTOR	1.5kΩ, 1/10W
R209	QRSA08J-335YN	RESISTOR	3.3MΩ, 1/10W
R210	QRD123J-331SX	RESISTOR	330Ω, 1/2W
R211	QRSA08J-750YN	RESISTOR	75Ω, 1/10W
R212	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R213	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R214	QRSA08J-222YN	RESISTOR	2.2kΩ, 1/10W
R215	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R216	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R217	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R218	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R221	QRSA08J-750YN	RESISTOR	75Ω, 1/10W
R222	QRSA08J-750YN	RESISTOR	75Ω, 1/10W
R226	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
R227	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
R228	QRSA08J-221YN	RESISTOR	220Ω, 1/10W
R229	QRSA08J-101YN	RESISTOR	100Ω, 1/10W
R606	QRSA08J-473YN	RESISTOR	47kΩ, 1/10W
R607	QRSA08J-473YN	RESISTOR	47kΩ, 1/10W
R608	QRSA08J-333YN	RESISTOR	33kΩ, 1/10W
R609	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R610	QRSA08J-224YN	RESISTOR	220kΩ, 1/10W
R611	QRSA08J-682YN	RESISTOR	6.8kΩ, 1/10W
R612	QRSA08J-682YN	RESISTOR	6.8kΩ, 1/10W
R614	QRSA08J-472YN	RESISTOR	4.7kΩ, 1/10W
R615	QRSA08J-682YN	RESISTOR	6.8kΩ, 1/10W
R616	QRSA08J-682YN	RESISTOR	6.8kΩ, 1/10W
R1411	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
R1412	QRD123J-331SX	RESISTOR	330Ω, 1/2W
R1413	QRSA08J-393YN	RESISTOR	39kΩ, 1/10W
R1414	QRSA08J-102YN	RESISTOR	1kΩ, 1/10W
C201	QETA0JM-477	E CAPACITOR	470μF, 6.3V
C202	QEKJ1CM-476	E CAPACITOR	47μF, 16V
C203	QCYA1HK-103	CAPACITOR	0.01μF, 50V
C204	QETA1CM-337	E CAPACITOR	330μF, 16V
C205	QEKJ0JM-476	E CAPACITOR	47μF, 6.3V
C206	QCYA1EK-104	CAPACITOR	0.1μF, 25V
C207	QEKJ1HM-474	E CAPACITOR	0.47μF, 50V
C208	QEP61HM-474	NP E CAPACITOR	0.47μF, 50V
C209	QEP61HM-105	NP E CAPACITOR	1μF, 50V
C210	QEKJ1HM-105	E CAPACITOR	1μF, 50V
C211	QETA0JM-477	E CAPACITOR	470μF, 6.3V
C212	QCTA1CH-330	CAPACITOR	33pF, 16V
C213	QCTA1CH-330	CAPACITOR	33pF, 16V
C214	QCTA1CH-330	CAPACITOR	33pF, 16V
C215	QCTA1CH-330	CAPACITOR	33pF, 16V
C217	QEKJ1CM-476	E CAPACITOR	47μF, 16V
C605	QEKJ1CM-106	E CAPACITOR	10μF, 16V
C606	QCYA1EK-223	CAPACITOR	0.022μF, 25V
C607	QEKJ1CM-106	E CAPACITOR	10μF, 16V

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C610	QEKJ1CM-106	E CAPACITOR	10μF, 16V
C611	QEKJ1CM-476	E CAPACITOR	47μF, 16V
C612	QEKJ1CM-476	E CAPACITOR	47μF, 16V
C613	QEKJ1CM-476	E CAPACITOR	47μF, 16V
C614	QEKJ1CM-106	E CAPACITOR	10μF, 16V
C615	QEKJ1CM-106	E CAPACITOR	10μF, 16V
C1411	QCYA1HK-681	CAPACITOR	680pF, 50V
C1412	QCYA1HK-681	CAPACITOR	680pF, 50V
C1413	QCYA1HK-102	CAPACITOR	0.001μF, 50V
C1415	QCYA1HK-102	CAPACITOR	0.001μF, 50V
C1416	QCYA1HK-681	CAPACITOR	680pF, 50V
C1417	QCYA1HK-681	CAPACITOR	680pF, 50V
L203	PU59152-1R0J	COIL	1μH
L204	PU59152-1R0J	COIL	1μH
L205	PU59152-1R0J	COIL	1μH
L206	PU59152-1R0J	COIL	1μH
L1411	PU59152-4R7J	COIL	4.7μH
L1412	PU59152-4R7J	COIL	4.7μH
L1413	PU59152-4R7J	COIL	4.7μH
L1414	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
L1415	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
L1416	PU59152-3R3J	COIL	3.3μH
L1417	PU59152-4R7J	COIL	4.7μH
L1418	PU59152-4R7J	COIL	4.7μH
L1420	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
L1421	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
L1422	PU59152-1R0J	COIL	1μH
EQ201	PELN0877	EQUALIZER	
S1411	PESW0695	SLIDE SWITCH, AV2	
ET1	PQ21987	EARTH PLATE, TERMINAL	
TB1	PQ35509E	TERMINAL BOARD ASSY	
OT1	SDSF3008Z	SCREW, X6 TERMINAL BOARD ASSY	
W201	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
W202	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
W203	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
W204	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
W205	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
W206	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
J1411	PEMC1019	RGB21PIN SOCKET, AV1	
J1412	PEMC1019	RGB21PIN SOCKET, AV2	
CN1411	PEMC1167-117	CONNECTOR, (1-17) MAIN	
CN1412	PEMC1167-112	CONNECTOR, (1-12) MAIN	

AUDIO/CONTROL HEAD BOARD ASSY < 12 >

PW1	PB40068A-01	A/CTL HEAD BOARD ASSEMBLY
CN1	PU60910-107	CONNECTOR, (1-7) MAIN

#△ REF No. PART No. PART NAME, DESCRIPTION

SW/DISPLAY BOARD ASSEMBLY <28>

PW1	PB10973E1	SW/DISPLAY BOARD ASSEMBLY	
IC1201	UPD16311GC(P)	IC	
	or UPD16311GC(E)	IC	
	or UPD16311GC(K)	IC	
IC1202	SPS-442-1	IR DETECT UNIT	
	or HC-377J	IR DETECT UNIT	
	or GP1U581X	IR DETECT UNIT	
D1201	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D1202	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D1203	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D1204	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D1210	RD3.3ES-T1B2	ZENER DIODE	
D1220	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D1221	1N4148M	DIODE	
	or 1SS132Y	DIODE	
D1224	1N4148M	DIODE	
	or 1SS132Y	DIODE	
R1201	QRD161J-333	RESISTOR	33kΩ, 1/6W
R1202	QRD161J-333	RESISTOR	33kΩ, 1/6W
R1203	QRD161J-333	RESISTOR	33kΩ, 1/6W
R1204	QRD161J-333	RESISTOR	33kΩ, 1/6W
R1205	QRD161J-472	RESISTOR	4.7kΩ, 1/6W
R1206	QRD161J-472	RESISTOR	4.7kΩ, 1/6W
R1207	QRD161J-102	RESISTOR	1kΩ, 1/6W
R1208	QRD161J-563	RESISTOR	56kΩ, 1/6W
R1209	QRD161J-103	RESISTOR	10kΩ, 1/6W
R1210	QRD161J-103	RESISTOR	10kΩ, 1/6W
R1211	QRD161J-103	RESISTOR	10kΩ, 1/6W
R1212	QRD161J-472	RESISTOR	4.7kΩ, 1/6W
R1225	QRD161J-333	RESISTOR	33kΩ, 1/6W
R1226	QRD161J-333	RESISTOR	33kΩ, 1/6W
R1227	QRD161J-333	RESISTOR	33kΩ, 1/6W
R1228	QRD161J-333	RESISTOR	33kΩ, 1/6W
C1201	QETC1CM-336	E CAPACITOR	33μF, 16V
C1202	QCFB1HZ-104	CAPACITOR	0.1μF, 50V
C1203	QETC1HM-106	E CAPACITOR	10μF, 50V
C1204	QCSB1HJ-330	CAPACITOR	33pF, 50V
C1205	QCSB1HJ-330	CAPACITOR	33pF, 50V
C1206	QETC0JM-227	E CAPACITOR	220μF, 6.3V
C1210	QCC11EJ-473	CAPACITOR	0.047μF, 25V
C1211	QCC11EJ-473	CAPACITOR	0.047μF, 25V
L1201	PU48530-101K	COIL	100μH
S1205	PESW0525-02Z	TACT SWITCH, PAUSE	
S1206	PESW0525-02Z	TACT SWITCH, REC/ITR	
S1207	PESW0525-02Z	TACT SWITCH, PLAY	
S1208	PESW0525-02Z	TACT SWITCH, STOP/EJECT	
S1213	PESW0525-02Z	TACT SWITCH, REVIEW	
DI1201	PEDP0189-02	FLUORESCENT DISPLAY PANEL	
HD2	PQ34668	FDP HOLDER(L)	
HD3	PQ34669	FDP HOLDER(R)	
FW1201	PW30101-60AA442	PARALLEL WIRE, REC SAFETY	
FW1202	PW30101-60AA442	PARALLEL WIRE, CASSETTE SWITCH	
CN1201	PEMC1101-113	CONNECTOR, (1-13) MAIN	

#△ REF No. PART No. PART NAME, DESCRIPTION
 CN1202 PEMC0724-007 CONNECTOR, (1-7) SW/JACK

REC SAFETY BOARD ASSEMBLY <32>

PW3	PB10973A3	REC SAFETY BOARD ASSEMBLY
S1241	PESW0589	PUSH SWITCH, REC SAFETY SW

CASSETTE SW BOARD ASSEMBLY <33>

PW4	PB10973A4	CASSETTE SWITCH BOARD ASSY
S1242	PU61320	PUSH SWITCH, CASSETTE SWITCH

SW/JACK BOARD ASSEMBLY <36>

PW2	PB10973D2	SW/JACK BOARD ASSEMBLY
S1201	PESW0525-02Z	TACT SWITCH, TV PROG +
S1202	PESW0525-02Z	TACT SWITCH, TV PROG -
S1203	PESW0525-02Z	TACT SWITCH, OPERATE
S1204	PESW0525-02Z	TACT SWITCH, C RESET
S1210	PESW0525-02Z	TACT SWITCH, TIMER
CN1203	PEMC0723-007	CONNECTOR, (1-7) DISPLAY

PRE/REC BOARD ASSEMBLY <43>

PW1	PB10976C	PRE/REC BOARD ASSEMBLY	
SD1	PQ21741-1-5	SHIELD FRAME, PRE	
IC101	HA118295NT	IC	
Q101	2SC4081(QRS)	TRANSISTOR	
	or 2SD1819A(QRS)	TRANSISTOR	
Q102	DTA144WU	TRANSISTOR	
	or UN511E	TRANSISTOR	
Q103	DTC144WU	TRANSISTOR	
	or UN521E	TRANSISTOR	
Q104	2SC4081(QRS)	TRANSISTOR	
	or 2SD1819A(QRS)	TRANSISTOR	
R101	QRSA08J-113YN	RESISTOR	11kΩ, 1/10W
R102	QRSA08J-332YN	RESISTOR	3.3kΩ, 1/10W
R103	QRSA08J-103YN	RESISTOR	10kΩ, 1/10W
R104	QRSA08J-122YN	RESISTOR	1.2kΩ, 1/10W
R105	QRSA08J-471YN	RESISTOR	470Ω, 1/10W
R107	QRD161J-182	RESISTOR	1.8kΩ, 1/6W
R109	QRSA08J-152YN	RESISTOR	1.5kΩ, 1/10W

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R110	QRD161J-681	RESISTOR	680Ω, 1/6W
C101	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
C102	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
C103	QCYA1EK-104	CAPACITOR	0.1μF, 25V
C104	QER60JM-476	E CAPACITOR	47μF, 6.3V
C105	QCYA1EK-473	CAPACITOR	0.047μF, 25V
C106	QCYA1HK-272	CAPACITOR	0.0027μF, 50V
C107	QCYA1HK-103	CAPACITOR	0.01μF, 50V
C110	QCYA1EK-223	CAPACITOR	0.022μF, 25V
C111	QCYA1EK-223	CAPACITOR	0.022μF, 25V
C112	QCYA1EK-223	CAPACITOR	0.022μF, 25V
C113	QCYA1EK-223	CAPACITOR	0.022μF, 25V
C114	QCYA1EK-223	CAPACITOR	0.022μF, 25V
C118	QCYA1EK-223	CAPACITOR	0.022μF, 25V
C120	QCTA1CH-331	CAPACITOR	330pF, 16V
C121	QCYA1EK-104	CAPACITOR	0.1μF, 25V
C123	QCTA1CH-560	CAPACITOR	56pF, 16V
C124	QCTA1CH-560	CAPACITOR	56pF, 16V
C125	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
C127	QCFA1HZ-103	CAPACITOR	0.01μF, 50V
C129	QCYA1EK-104	CAPACITOR	0.1μF, 25V
C130	QCTA1CH-470	CAPACITOR	47pF, 16V
L101	PELN0530-101JZ	COIL	100μH
L103	PU59152-181J	COIL	180μH
CN101	PU59973-4	CONNECTOR, (1-4) UPPER DRUM	
CN102	PEMC1167-113	CONNECTOR, (1-13) MAIN	

PDC BOARD ASSEMBLY < 70 >

PW5	PB10973C5	PDC BOARD ASSEMBLY	
IC1901	MV1822	IC	
Q1901	DTC144ES	TRANSISTOR	
R1902	QRD161J-472	RESISTOR	4.7kΩ, 1/6W
R1903	QRD161J-221	RESISTOR	220Ω, 1/6W
R1904	QRD161J-221	RESISTOR	220Ω, 1/6W
R1908	QRD161J-473	RESISTOR	47kΩ, 1/6W
R1909	QRD162J-221	RESISTOR	220Ω, 1/6W
C1901	QCSB1HJ-560	CAPACITOR	56pF, 50V
C1902	QCSB1HJ-560	CAPACITOR	56pF, 50V
C1904	QFV21HJ-184	F CAPACITOR	0.18μF, 50V
C1906	QFV21HJ-184	F CAPACITOR	0.18μF, 50V
C1908	QCVB1CN-103	CAPACITOR	0.01μF, 16V
C1909	QETF1CM-476	E CAPACITOR	47μF, 16V
C1914	QFV21HJ-103	F CAPACITOR	0.01μF, 50V
C1915	QCSB1HJ-680	CAPACITOR	68pF, 50V
LC1901	PU60950-101GZ	N FILTER	
LC1902	PU59736-103	N FILTER	
LC1903	PU60950-101GZ	N FILTER	
LC1904	PU60950-101GZ	N FILTER	
LC1906	PU60950-101GZ	N FILTER	
X1901	PEVB0551	CRYSTAL RESONATOR	
CN1901	PEMC0713-108	CONNECTOR, (1-8) MAIN	
SD1	PU61069-1-2	SHIELD CASE	
SD2	PU61070	SHIELD COVER	
SD3	PU61071	SHIELD PLATE	

SECTION 6

TECHNICAL INFORMATION

6.1 SYSCON CIRCUIT

6.1.1 Syscon CPU pin function(IC701) 1/2

PIN NO.	LABEL	IN/OUT	NOTE
1	S.CURVE	IN	TUNING CHECK
2	AVG FM	IN	AUTO TRACKING DATA(AVRG VOLTAGE OF PB LEVEL INPUT)
3	P.DOWN	IN	POWER DOWN DETECT(POWER DOWN:H → L)
4	6.5H DET	IN	PB SWITCHING POINT ADJUST PUKSE
5	AVSS	-	GND
6	TEST	-	GND
7	X2	-	TIMER CLOCK(32.768KHz)
8	X1	-	TIMER CLOCK(32.768KHz)
9	VSS	-	GND
10	OSC1	IN	SYSTEM CLOCK(10MHz)
11	OSC2	OUT	SYSTEM CLOCK(10MHz)
12	RESET	IN	RESET AT CONNECT VCR TO AC
13	(NMI)	-	NC
14	LSC	IN	MECHANIZM MODE DETECT(C)
15	LSB	IN	MECHANIZM MODE DETECT(B)
16	LSA	IN	MECHANIZM MODE DETECT(A)
17	C.LEND	IN	CASSETTE TAPE LOAD SWITCH(CASSETTE IN:L)
18	RECSF	IN	REC SAFETY SWITCH DETECT(SW ON:L)
19	STTS	IN	LEADER TAPE DETECT(DETECT ON:L)
20	SECAM DET	-	NC
21	MESECAM DET	IN	MESECAM MODE:H
22	TU FG	IN	TAKE-UP REEL ROTATION DET/TAPE REMAIN
23	SUP FG	IN	SUPPLY REEL ROTATION DET/TAPE REMAIN
24	A.MUTE	OUT	AUDIO MUTE CONTROL(MUTE ON:H)
25	SHUTTLE	IN	SHUTTLE SWITCH
26	JSB	IN	JOG PULSE INPUT(B)
27	JSA	IN	JOG PULSE INPUT(A)
28	SERVO	OUT	CAPSTAN MOTOR CONTROL(SERVO:L/SYSCON:H)
29	LOCK DET	IN	TUNING LOCK CHECK
30	PLL CE	OUT	TUNING CONTROL CHIP ENABLE
31	REC ST	OUT	REC START:H
32	PLL DATA	OUT	TUNING CONTROL SERIAL DATA OUTPUT
33	LCM3	OUT	LOADING MOTOR DRIVE(3)
34	-	-	NC
35	P.MUTE	OUT	PICTURE MUTE CONROL(MUTE ON:L)
36	DUTY I/O	IN/OUT	IN/OUT INDEX DATA CONTROL
37	B/W	OUT	BLACK/WHITE SWITCH DETECT
38	REC	OUT	REC MODE:H
39	R.PAUSE	IN	REMOTE PAUSE CONTROL(PAUSE ON:L)
40	DOCTOR	IN	DOCTOR PROGRAM DETECT

Table 6-1-1 SYSCON CPU pin function(1/2)

6.1.2 Syscon CPU pin function(IC701) 2/2

PIN NO.	LABEL	IN/OUT	NOTE
41	EXP DATA2	OUT	EXPANDER IC(IC706) DATA OUTPUT
42	EXP DATA1	OUT	EXPANDER IC(IC705) DATA OUTPUT
43	I2C CLK	OUT	PDC DATA TRANSFER CLOCK
44	I2C DATA	OUT	PDC DATA OUTPUT
45	VPCTL	OUT	V.PULSE ADDITION TIMING CONTROL
46	MODE1/DAV	OUT	MODE1 SELECT
47	MODE2	OUT	MODE2 SELECT
48	FLY ERS	-	NC
49	ENDS	IN	TRAILER TAPE DETECT(DETECT ON:L)
50	RC IN	IN	REMOTE CONTROL DATA INPUT
51	SCR IN	IN	SCRAMBLE SIGNAL
52	CTL C/D	IN	CTL PULSE INPUT(MODE DETECT/BLANK PORTION DET)
53	RAE OUT	OUT	REMOTE PAUSE CONTROL OUTPUT
54	CAP REV	OUT	CAPSTAN MOTOR CONTROL(FWD:H/REV:L)
55	OSD CS	OUT	ON SCREEN IC CHIP SELECT
56	COM-CLOCK	OUT	MEMORY IC DATA TRANSFER CLOCK
57	S-OUT	OUT	ON SCREEN CONTROL DATA
58	S-IN	IN	ON SCREEN/FDP CONTROL DATA
59	S-CLK	OUT	DATA TRANSFER CLOCK
60	H DATA	OUT	VIDEO IC CONTROL DATA
61	STB	OUT	CLOCK OUTPUT PERMISSION
62	H CLK	OUT	VIDEO IC DATA TRANSFER CLOCK
63	VCC	-	SYSTEM POWER
64	CH+ DATA	OUT	IIL LOGIC CTL DATA
65	S-DATA	OUT	SERVO IC CONTROL DATA
66	PAUSE(L)	OUT	CAPSTAN MOTOR CONTROL(PAUSE:L)
67	CTL CLOCK	IN	INDEX CONTROL
68	LCM2	OUT	LOADING MOTOR DRIVE(2)
69	CAP FG	IN	TAPE SPEED DETECT/BACK SPACE COUNT
70	LCM1	OUT	LOADING MOTOR DRIVE(1)
71	D.FF	IN	DRUM ROTATION DETECT/REC TIMING CONTROL
72	AVCC	-	SYSTEM POWER(for ANALOG)
73	AV2/CH+	-	NC
74	SYNC DET	IN	SYNC DET(NO SYNC:H)
75	DRUM V	OUT	DRUM MOTOR VOLTAGE CONTROL
76	CAP V	OUT	CAPSTAN MOTOR VOLTAGE DETECT
77	DV DET	IN	DRUM DRIVE VOLTAGE DET
78	PROTECT	IN	SWD5V/12V DETECT
79	IF AGC	-	NC
80	-	-	NC

Table 6-1-2 SYSCON CPU pin function(1/2)